

July, 1914

# The Canadian Builder and Carpenter

PUBLISHED ONCE A MONTH BY THE COMMERCIAL PRESS, LIMITED

Vol. 4

TORONTO, JULY, 1914

No. 7

Uncle Si  
Says:

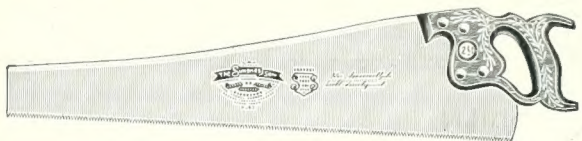
"I TELL  
YOU IT'S  
A GREAT  
SAW"



**SIMONDS SAW**  
PRONOUNCED SIMONDS

Simonds Mfg. Co.  
Fitchburg, Mass. Chicago, Ill.

"THERE'S a guarantee that goes with every Simonds Saw that I like to read over now and then. It goes this way: If at any time the user of a Simonds Saw finds anything wrong with it, he's got a new Saw coming, or can have his money returned. You're the man that's got to be satisfied. You can't own a Simonds Saw and be dissatisfied. Pretty plain English, isn't it? But then the Simonds is so good that it can stand a strong guarantee like that."



Tell your Hardware Dealer you want a Simonds Hand Saw. If he hasn't got it, send us \$2.50 and we will send you a 24 or 26-inch Saw, Cross-Cut or Rip, any point, straight or skew back. Simonds Crucible Steel Blade, carved and polished apple wood handle. Absolutely guaranteed. Unexcelled by any other Hand Saw made anywhere.

Write for a Free Copy of  
SIMONDS CARPENTER RULE BOOKLET

**Simonds Canada Saw Company, Limited**

ST. JOHN, N.B.

St. Remi St. and Acorn Ave., MONTREAL, Que.

VANCOUVER, B.C.



# Midland Planing Mill Products

The Leading Stock Lines

Something New In Canada

## 3/8 Inch Square Joint Veneer Hardwood Flooring

Plain Oak

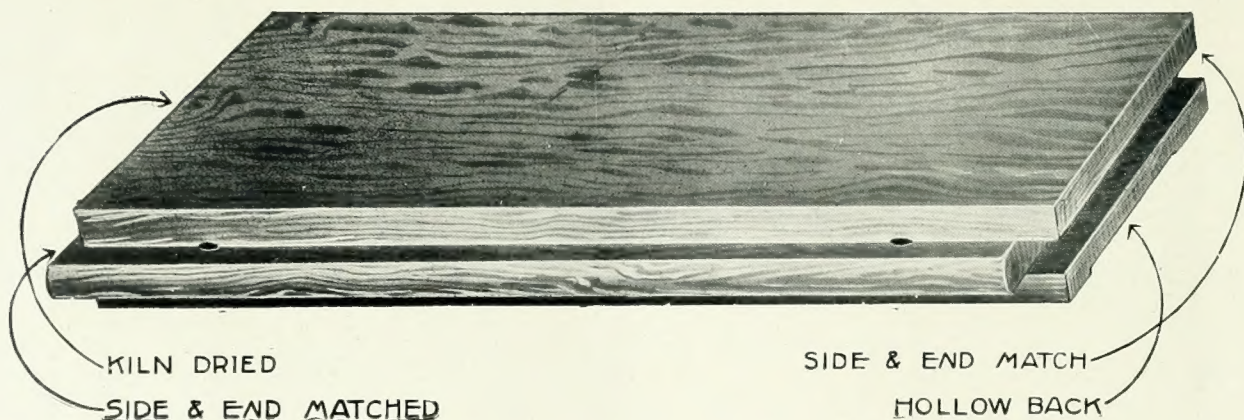
Quarter Cut Oak

This flooring has quite a demand in the United States because it costs less per square, and is cheaper to lay than the matched flooring. It is nailed through the face, punched and puttied.

We have installed the latest and best equipped machinery for manufacturing Square Joint Veneer Flooring, and are the first to specialize it in Canada.

Prices for face measure, the same as Matched Flooring, Strip. Widths are:  $1\frac{1}{2}$  inch,  $1\frac{3}{4}$  inch and 2 inch. Grades: Clear and No. 1.

## Pointers on Beech Hardwood Flooring



- Pointer No. 1.*—Government Tests show that in wearing qualities, it will outlast Birch or Oak.  
*Pointer No. 2.*—Its appearance is rich and even in color, similar to Extra Selected Red Oak Stock.  
*Pointer No. 3.*—On account of its close texture, it machines nicely and does not sliver.  
*Pointer No. 4.*—Our stock is from around Midland, where the finest Beech and Maple in North America grows.  
*Pointer No. 5.*—This stock runs strong to Long Lengths.  
*Pointer No. 6.*—It makes the **Best** hardwood flooring.  
*Pointer No. 7.*—It's the **Cheapest** hardwood flooring, only because it is the least known.  
*Pointer No. 8.*—9/16 Beech is the greatest Bargain Buy to-day. Especially suited for Apartment Houses and Private Dwellings.

# Georgian Bay Shook Mills, Limited

MANUFACTURERS FROM THE TREE TO THE FINISHED PRODUCT

Midland, Ontario



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# Midland Planing Mill Products

The Leading Stock Lines

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## Sawdust and Cuttings

A BUSY Plant in a Lean Year is a sure sign that someone is Delivering the Goods.

Orders never were so Plentiful, Business never was Better, and our Customers were never so Well Served.

Beware of Cut Prices. The Chances are you will only get what you pay for.

CONSIDER the Advantage of buying from a Concern that manufactures all the different Lines that you require. That Concern will give you Service.

The Planing Mill that saws its own Timber and makes Purchases in big Blocks is the one that can make you the Best Price.

Order early and your Goods will be at hand when you need them.

ONE Door in the Stock Shed is worth two in the Cutting-Up Room. Buy Stock Doors for Prompt Shipment.

It costs less to glaze Stock Sash, and it costs less to buy them. Make your Frames right, and save Money, Time, and Worry.

The Fir Door is the cheapest door that will take a satisfactory Hardwood Finish. It is built on Scientific Lines, and will not warp or twist.

Use 9-16-inch Beech Flooring for your Apartment Houses and Private Dwellings. It is the greatest Bargain Buy in Hardwood Flooring.

MIDLAND Specials are the lowest-priced high-grade Veneered Doors you can buy. They are made in Canada.

"Midland Brand" on Hardwood Flooring is like the "Sterling" mark on silver.

Styles in House Building change like styles in Wearing Apparel. Our Stock Designs are like the Futurist Fads—a little bit ahead of anything else.

FOR Quality, Service, and Satisfaction, place your Orders with us. We are the Kind of a Concern that wants the Kind of a Customer that You are.

Three good Catalogues to have—Midland Doors, Midland Sash, and Midland Stock Design Planing Mill Products. Write for them to-day.

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# Georgian Bay Shook Mills, Limited

MANUFACTURERS FROM THE TREE TO THE FINISHED PRODUCT

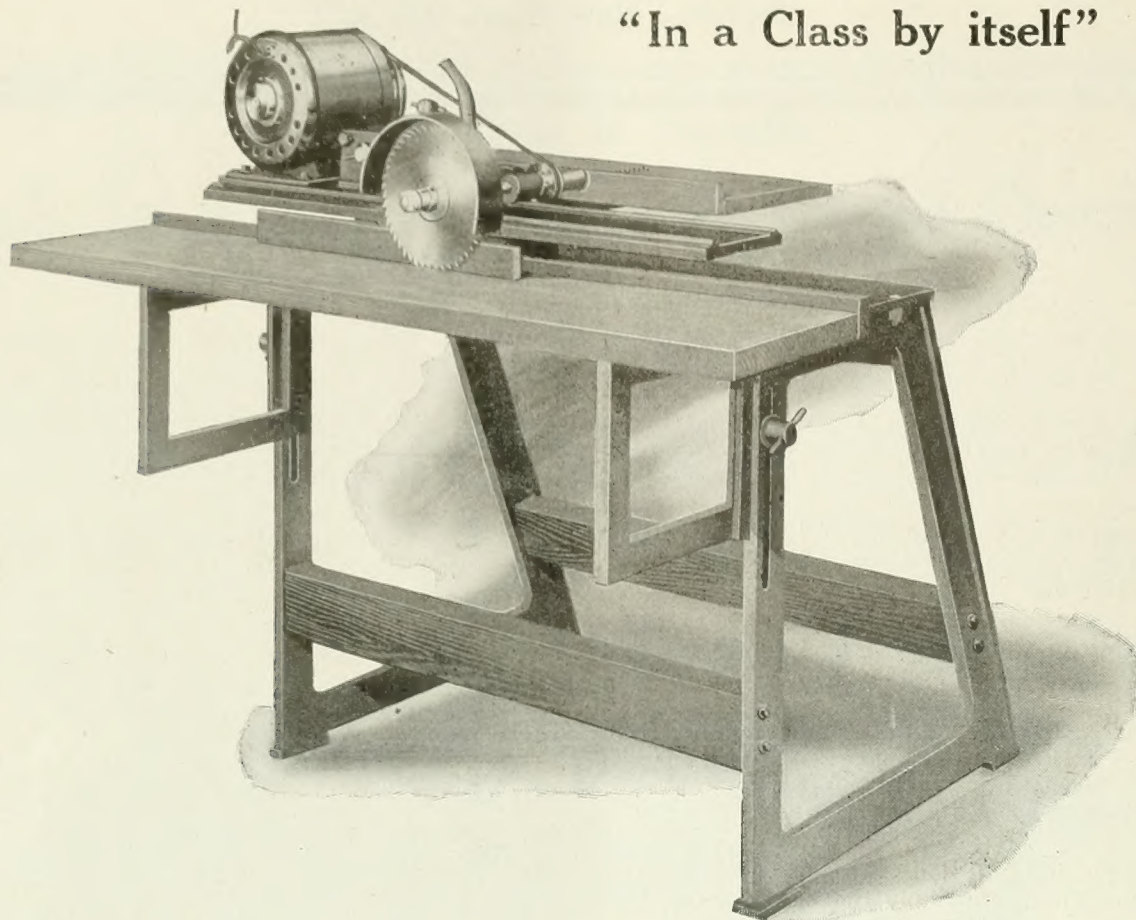
Midland, Ontario

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# The Elliot Woodworker

"In a Class by itself"



The Elliot Woodworker, patented June 1910

With the "Elliot" you can do things that no other machine can do so quickly or so well. Its usefulness and worth have been demonstrated by hundreds of users all over Canada.

The Elliot Woodworker does cross cutting, ripping, mitreing, boring, grooving, dado, box frames, house out stair strings, rabbeting, grinding, sanding, etc., right on the job and at a third less than it is costing you now.

#### Some Recent Sales of Elliot Woodworkers

Wm. Cowlin & Sons, Contractors, New	McLean Building, Toronto
The Standard Structural Co., Toronto	J. M. Walker, Toronto
Donnenfield Bros., 2 machines	Alfred Smithers, Toronto
L. A. Beatty, Toronto	J. J. Downey, Toronto
Ontario Furniture Co., Montreal	Maurice & Frere, Montreal
D. M. Long, Inc., Montreal	C. E. Deakin, Ltd., "
St. Agathe Lumber & Construction Co.,	Montreal
R. J. Coleman, Hamilton	James Ireland, Hamilton
A. T. Smith, Hamilton	J. S. Hohner, Berlin
H. Dunken & Sons, Berlin	Pounder Bros., Stratford
L. H. Martyn, London	Construction Dept., Hospital
Jno. Thew, Welland	for Feeble Minded, Orillia

#### Unsolicited Praise

Your Woodworker without doubt is the best thing I have on the building. I would not do without it. Not only is it a time saver, but I am using piles of cuttings that otherwise would have been thrown away for firewood.

Yours truly,

JNO. THEW, Contractor,  
High School Building, Welland, Ont.

Send for Prices and Descriptive Circulars of Elliot Woodworking Machines

## The Elliot Woodworker, Limited

College and Bathurst Streets

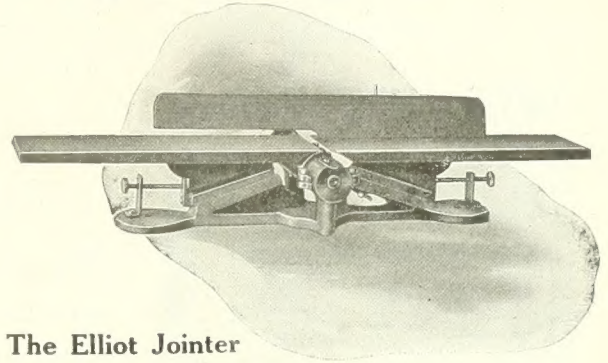
Toronto, Canada



# The New Elliot Bench Jointer

*A Practical Jointer that meets a long felt want*

This machine is light and servicable and cuts 6 inches by 3-8. It has a perfectly balanced head that can be run 5,000 R. P. M., making a beautiful smooth cut. Fence tilts 45 degrees. It is just the machine you need for edging, dressing up a small job, bevelling hand rails or casing for bay windows, and numerous other purposes.



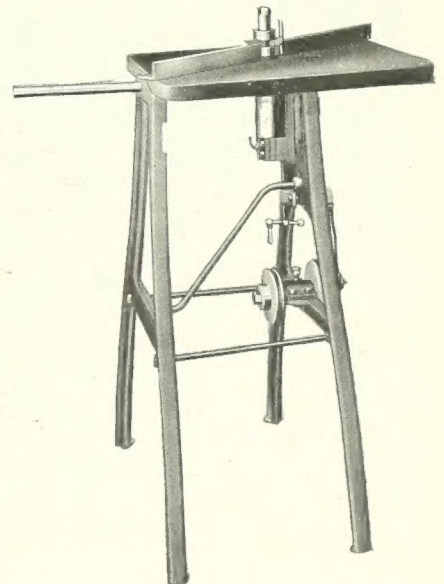
The Elliot Jointer

## The Elliot Scroll Saw and Shaper

This is a Combination Machine that can instantly be set for scroll sawing or shaping.

Scroll saw cuts up to 2 inches thick and is useful for cutting cambers, corner blocks, fancy balusters, brackets, etc. Shaper attachment is removed when scroll saw is in use. The shaper is a high grade machine running at 5,000 revolutions per minute.

Almost any kind of moulding or shaping can be done on it. It is adjustable to use on lumber up to 3 inches thick.



### Agencies for Elliot Woodworking Machines

Montreal—H. D. Hall, 103-5th Ave., Maisonneuve

Ottawa—W. A. Rankin, Bank St.

Hamilton—F. Martin, 14 Halton Ave. N.

Winnipeg, Man.—H. W. Rosevear & Son

Edmonton, Alta.—H. Rae, 1323 25th St.

Vancouver, B. C.—W. N. O'Neil Co., Seymour St.

Head Office and Factory:

## The Elliot Woodworker, Limited

College and Bathurst Streets

Toronto, Can.



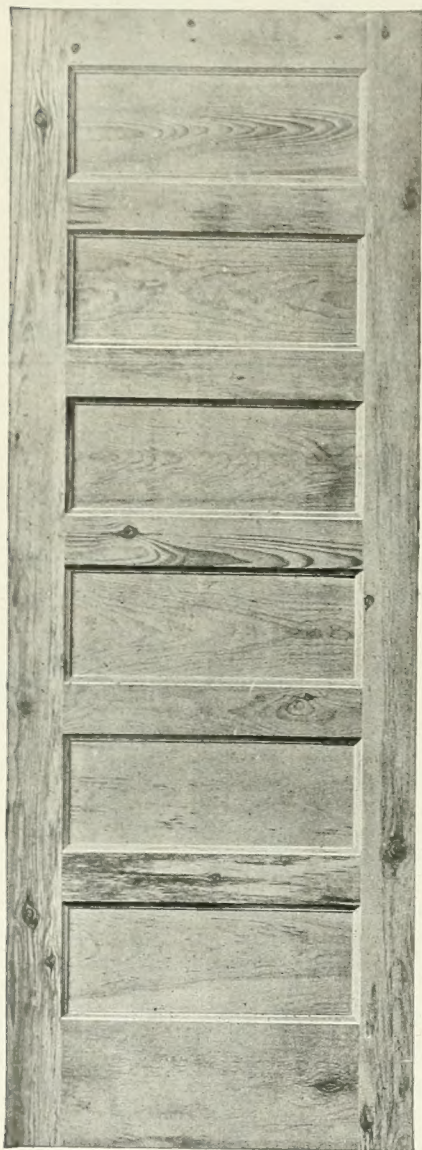
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# B. B. L. High Grade Planing Mill Products

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## Our Attractive "B" Grade Doors

### White Pine Panels

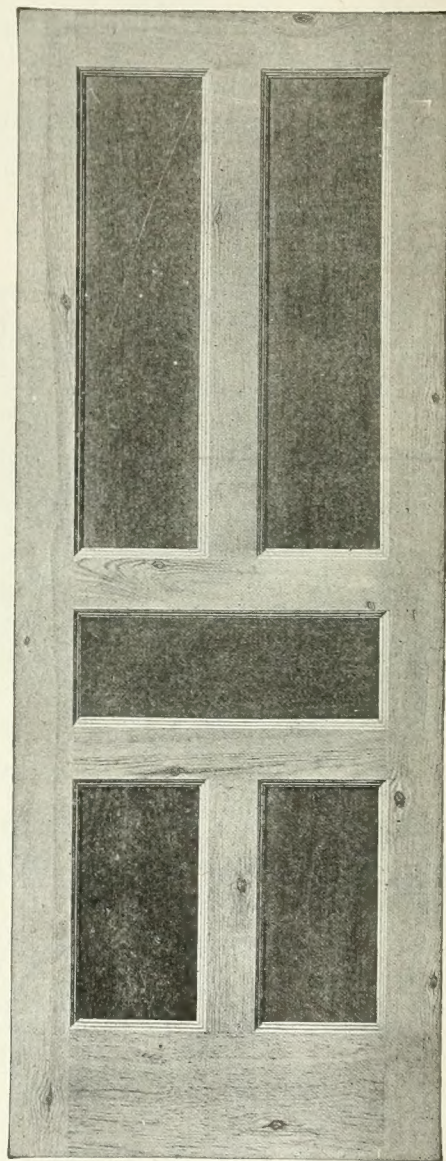


B grade doors are sound knotted Pine stiles and rails with clear panels for paint.

No plugs or Dutchmen.

Send us sample order and be convinced that grade, price and delivery are right.

### Gum Panels



## Benson & Bray, Limited

Midland

Ontario

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# B. B. L. High Grade Planing Mill Products

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## Write for Our New Catalogues

### Price Lists and Discounts

#### Our Catalogue of Doors.

#### Solid or Veneered

Illustrates Forty of our designs which we make in White Pine, Yellow Pine, Cypress, Chestnut, Oak or any other Hardwood.

A copy on your desk will prove a valuable guide in making future selections.

#### Our Catalogue of Mouldings.

#### Sash and Columns

contains full size illustrations of all our mouldings. A great variety of new and desirable effects are included, many of which are shown for the first time.

You will find this catalogue well worth keeping on file.

Our plant is equipped to manufacture the highest grade goods at the lowest prices.

Write for these catalogues and price lists today, and make comparisons.

## Benson & Bray, Limited

Midland

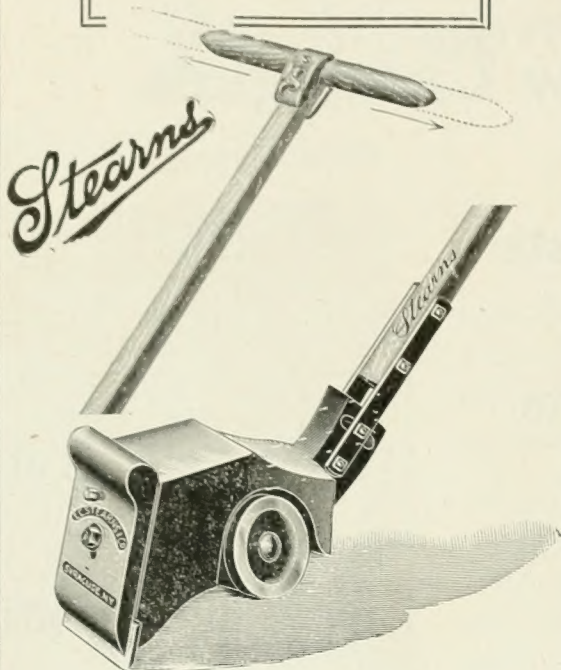
Ontario

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## Extra Money

Your Building Trade  
Acquaintance will be  
of value to you



### ONE CARPENTER OR BUILDER IN EACH TOWN

can help supply the widespread demand for the Stearns Floor Scraper—a demand we have created through systematic advertising and conscientious manufacture. This machine is simplicity itself—no intricate, costly mechanism—and is absolutely unequalled for efficiency. Splendid surfaces quickly worked. Convenient to handle and easy to adjust. These qualities together with its popular price make the Stearns a quick seller. Our agency proposition is attractive. Get in on this opportunity for extra money—a chance to do something without interfering with your regular work.

### Glance Over these Efficiency Points in Stearns Floor Scrapers

Long and cross handles adjustable, also wheels recessed into the scraper, allowing close work up to the walls and in corners. Two knives furnished with each machine. Knives are used on both edges, and being made without slots, they may be used up to nearly their full width. Two of our knives are equal to half a dozen that are slotted in order that they may be firmly held in position. Blades six inches wide. Rubber-tired wheels. Does clean smooth work in a jiffy. Shipping weight 135 lbs.

Don't let somebody else get ahead of you—We offer an agency proposition which will be quickly accepted over the entire Dominion. Write at once for particulars. Learn something for your early benefit.

**E. C. STEARNS & CO.**

100 Oneida Street  
SYRACUSE, N.Y., U.S.A.



This building is equipped  
with Athey Weather  
Strip.

## ATHEY Cloth Lined Metal Weather STRIP

No weather strip on the market can compare with "ATHEY" for all round excellence. The following are a few of its many outstanding features:

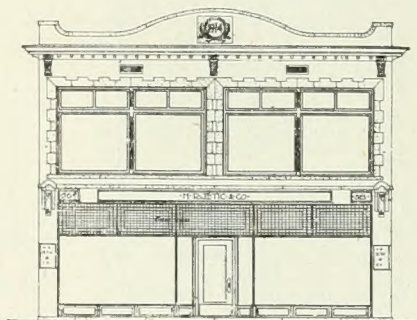
- ☐ Keeps out all draughts and dirt.
- ☐ Absolutely dust proof.
- ☐ Prevents sash from rattling.
- ☐ The only weather strip with a cloth-lined channel in the sash.
- ☐ Effects a considerable saving in coal bills.

Write for particulars, prices, etc.

**The Eberhard-Wood Mfg. Co.**

Ornamental and General Iron Works

36-38 Lombard St. - - TORONTO



## This Metal Store Front Will Not Fog Nor Frost

The Petz Metal Store Front Sash will ventilate the store window all around. Put in a full height window-back and you have a show window that will be working 365 days in the year. Ask the merchant what that means to him.

Then add the fact that the Petz Store Front is the safest and that it commands the lowest insurance rate and you can see where you will be favoring the owners by using the Petz.

It is a very easy bar to install as you can see by the description in the book "Modern Store Front Construction" which we will mail if you ask for it.

**DETROIT SHOW CASE CO.**

494 West Fort St. - Detroit, Mich., U.S.A.





## The Disston Standard of Quality Applies to Every One of Their Products

From the beginning, 74 years ago, a high standard was set for Disston Brand Goods. This standard has been raised to keep pace with the advance of the times. So high is this standard that both dealers and mechanics have come to look upon a Disston Saw or Tool as the standard by which to judge all others.

Henry Disston, himself a finished mechanic, insisted upon sending his sons into the shop to learn the business as he did. Realizing the importance of this early training, his sons in turn placed their sons in the shops until they thoroughly understood the manufacturing end of the business.

This means that the sons and grandsons of Henry Disston, who today manage the great business which he established, are all practical men. They know the business from the ground up, which assures a maintenance of the efficiency and high quality of all products manufactured by the Disston Works.

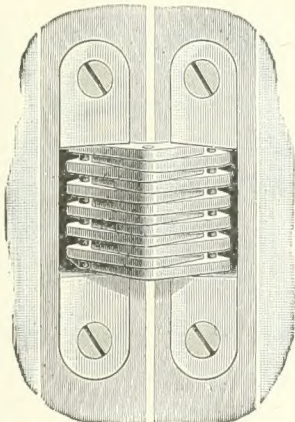
### HENRY DISSTON & SONS INCORPORATED

Keystone Saw, Tool, Steel & File Works  
PHILADELPHIA, PA., U. S. A.



## Soss Invisible Hinge

For use on Panel Work, Lockers  
Closets, Counter Flaps, Partition  
Doors, Cabinets, etc.

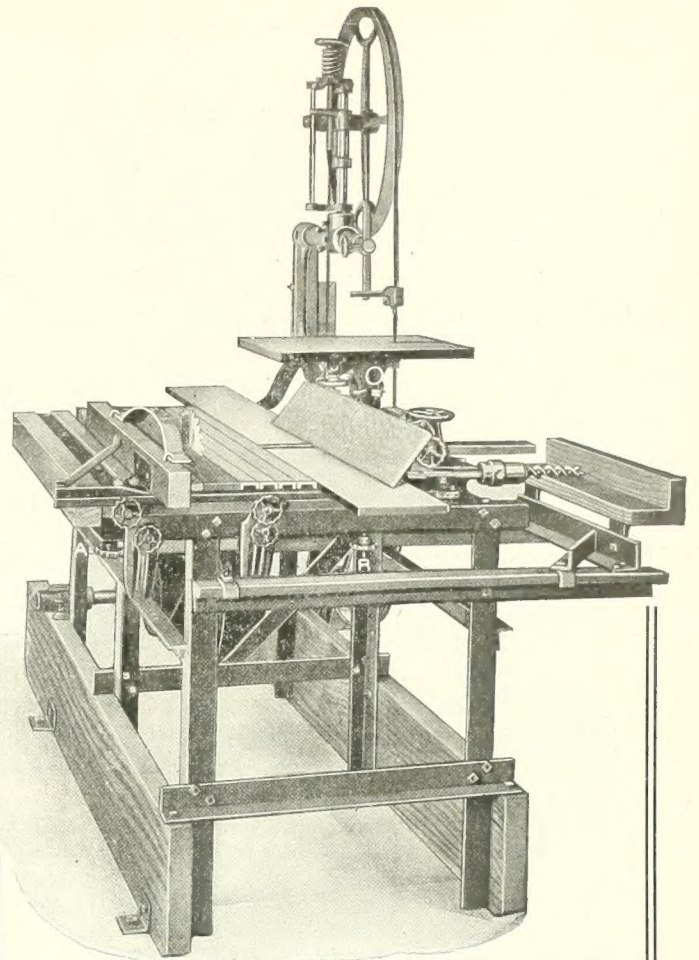


Soss Invisible Hinges are made in a variety of sizes, the largest being adapted for largest size door.

Send for circular and prices; or buy from  
leading Hardware Dealers

**SOSS INVISIBLE HINGE CO., LIMITED**

104 Bathurst St., TORONTO



## Combination Woodworker

**THIS MACHINE** is a combination Circular Saw Table, with Rip and Cross Cut Guides; one 10-inch Rip Saw, one 8-inch Cross Cut Saw, 6-inch or 12-inch Jointer with Tilting Guide, 22-inch swing Band Saw with  $\frac{3}{8}$ -inch Band Saw, Boring Attachment and chuck with countershaft mounted on rear of base.

**THE MOST USEFUL**, convenient and economical machine possible to install in your shop. Will do all your ripping, cross cutting, band sawing, boring, planing, straightening, squaring, beveling, grooving, rabbetting, moulding, etc.

**FOUR MACHINES** stand ready for instant use, without any change whatever. Three men can conveniently work at the same time band sawing, boring and either ripping or jointing. Different cutter heads can be used in place of circular saw or one man can turn from one class of work to another, and stop off either circular saw mandrel or band saw when not in use.

**POWER REQUIRED.** 1 to 3 horsepower, according to work to be done.

**PORTABLE MACHINE.** Simple, Strong and Ready-to-go with little Power.

We sell this machine at an exceptionally low price. Get our Catalogue "C" and our Thirty Days Trial Offer. We carry in stock the largest assortment of wood-working machines—Individual or Combined. Orders filled promptly.

**BOURNIVAL & CO.**

333-337 Notre Dame St. East, Montreal, Que.



# American Automatic Vertical Hollow Chisel Mortiser

**Frame.** Cored column type, heavy and rigid, with broad foot flange which makes it free from vibration. The table does not move, but the chisel descends to the work, which affords greater accuracy than when the material has to be raised to the chisel, particularly on long material which overhangs the table, as long material can thus be supported by means of a temporary trestle.

**Chisel Ram.** Reciprocates with quick return, in gibbed ways, with proper provision for taking up wear, and arranged with adjustable chisel holder. Operated automatically by foot treadle. Speeds of the chisel ram are: 10, 20 and 35 strokes per minute. Stroke adjustable from 0 to 4 inches.

**Bit Spindle.** Driven by noiseless miter gear, doing away with the troublesome idler for the right angle drive for the bit spindle.

There are three rates of speed used according to the rates of feed of the chisel ram; 2000, 2800 and 3600 RPM.

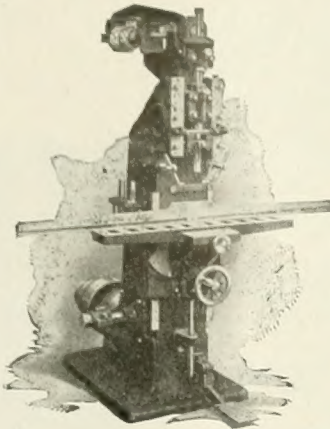


Fig. 901  
Ask for Price

**Table.** Securely gibbed to the frame and is adjustable vertically by hand wheel.

Can be tilted to an angle of thirty degrees right or left, and will allow a mortise to be made in the center of material  $5\frac{1}{2}$ " x wide by 12" high.

The fence is provided with spring spacing stop gauges which can be set for several mortises and different lengths, thus saving time otherwise consumed in marking off each piece to be mortised.

There is a line gauge attachment which can be used in connection with or without the spring stop gauges; this will be found to be very convenient when making mortises that have to be marked off and especially in long material where the spring stop gauges cannot be used. A supporting arm attached to the frame supports the work when mortising in the edge of wide material.

**Countershaft.** T. & L. Pulleys (self-oiling loose) 10" x 4" and should make 800 RPM.

**Furnished.** Three chisels, one each  $\frac{3}{8}$ ",  $\frac{1}{2}$ " and  $\frac{5}{8}$ " with bits to correspond. Extra. A clamp table with rack and pinion feed may be furnished at extra cost

*NOTE:—See page 38 of this issue for a descriptive article on new features of this machine.*

## The Stuart Machinery Co., Limited

764 Main St. - Winnipeg

## Wanted: Articles on Carpentry Work

From time to time you will have completed some interesting piece of Carpentry Work—which, if described and illustrated, will be of interest and value to other carpenters.

We want to get sketches and short descriptions of such work, and will pay for these articles at our regular rate.

### The Canadian Builder and Carpenter

32 Colborne Street, Toronto



RED  
S

BRAND  
WINDOW  
GLASS

## THE TORONTO PLATE GLASS IMPORTING COMPANY, LIMITED

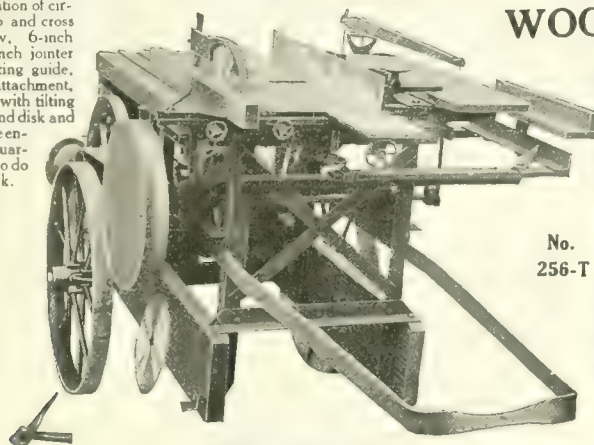
DON ROADWAY

Plate, Window, Figured, Stained, Wired, Bent, Mirror  
and Ornamental Glass

GLASS  
BENDERS  
TO  
THE  
TRADE

TORONTO

No. 256-T is a combination of circular rip and cross cut saw, 6-inch or 12-inch jointer with tilting guide, boring attachment, jig saw with tilting table, sand disk and gasoline engine guaranteed to do the work.



Write for Catalog No. 7

### Parks Portable Single or Combination WOODWORKING OUTFITS

Are the most practical—The most efficient—The most economical woodworking equipment you can buy.

Angle steel frame is the strongest structural material known.

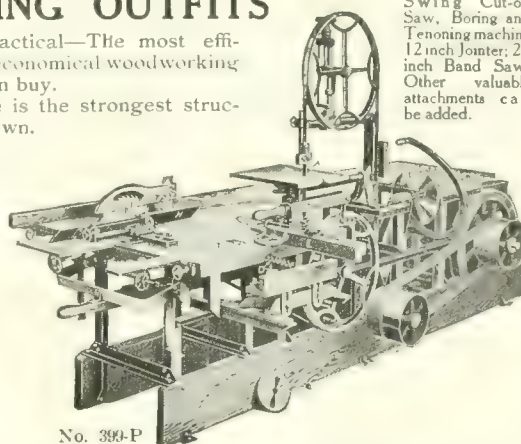
Machines made in large quantities which allows us to sell at lowest prices and make prompt shipment.

No.  
256-T

THE PARKS  
BALL  
BEARING  
MACHINE CO.

1501 Knowlton St.  
Cincinnati, Ohio

Circular Rip and Cross-Cut Saw, Swing Cut-off Saw, Boring and Tenoning machine 12 inch Jointer, 22 inch Band Saw. Other valuable attachments can be added.



No. 390-P

## Hardwood Flooring and Hardwood Interior Finish

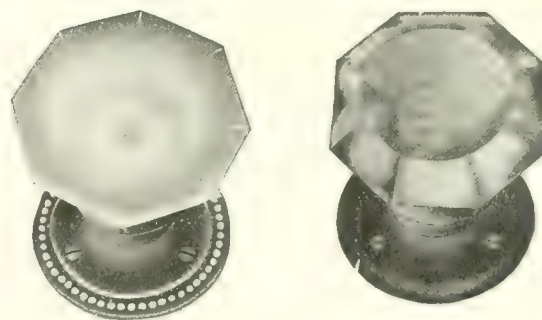
"WILSON BROS. LIMITED" on flooring means a carefully kiln-dried and well manufactured article. Our flooring is straightened, hollow-backed, bored, end-matched, steel polished and bundled.

We specialize in Veneered Doors to detail, also all kinds of Hardwood Interior Finish.

Write and send list and details for Quotations

*Wilson Bros. Limited*  
Collingwood, Ontario

## A Few of Our Line of Glass Knobs



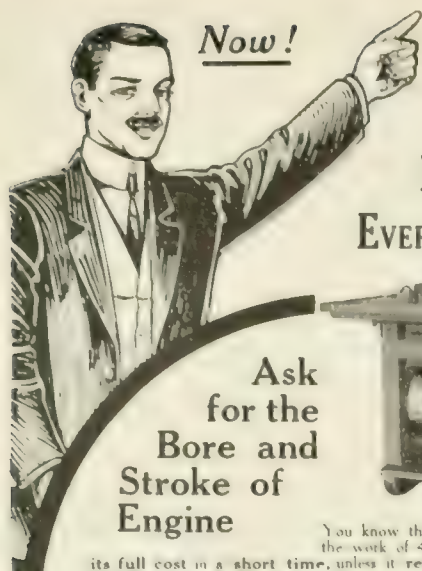
We Manufacture an extensive line of Glass Knobs, also all kinds of High-class Builders' Hardware.

Goods Guaranteed — Prices Right.

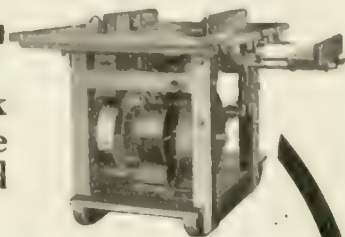
THE  
Belleville Hardware & Lock Mfg.  
COMPANY, LIMITED

BELLEVILLE :: CANADA





**Now!**  
Write  
for all the  
Facts and the  
EVEREADY Evidence



Ask  
for the  
Bore and  
Stroke of  
Engine

You know that no Saw Rig can do the work of 4 to 6 men and save its full cost in a short time, unless it really has the power. Our Engine has a 4 1/2 inch bore, 6-inch stroke, and we guarantee it will develop over 4 actual brake horse power.

### EVEREADY SAW RIG

Is powerful, extra strong and wear resisting, easily moved about and simple in operation. Besides Cross-cutting and Rip-sawing, it joints, Saws, big-saws, Grooves, Bores, Miters and Grinds Tools.

Write for free Catalog

**OSHKOSH MFG. CO.**

520 So. Main Street, Oshkosh, Wis.

CHICAGO 1440 Monadnock Bldg.

SAN FRANCISCO J. P. Dwan  
& Co., 455 Turk Street



Live  
Agents  
Wanted

# GLASS

*All Kinds of Glass  
for Building Purposes*

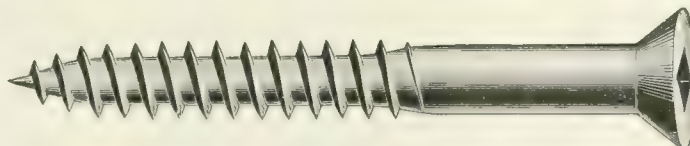
Plate, Window, Figured  
Ornamental  
Bent and Mirror Glass

**The Consolidated Plate Glass Co.  
of Canada, Limited**

TORONTO MONTREAL WINNIPEG

**ROBERTSON SOCKET  
HEAD**

# Wood Screws



Pat. Feb. 2, 1909

See  
That  
Square  
Hole

## THIS IS A REAL WOOD SCREW

It is driven by a simple square bit, and is the only one of its type on the market.

Driver fits snugly into the square hole and positively cannot slip and cut the fingers, or disfigure costly furniture or woodwork. It is driven with less exertion. No ragged slots after driving. Saves time, labor, money and material. We make the drivers in all suitable styles.

Drivers sent free with first order. Write for catalogue and prices.

**P. L. Robertson Mfg. Co., Limited**

We also manufacture Wire Nails, Rivets, Wire and Washers

**MILTON :: ONTARIO**





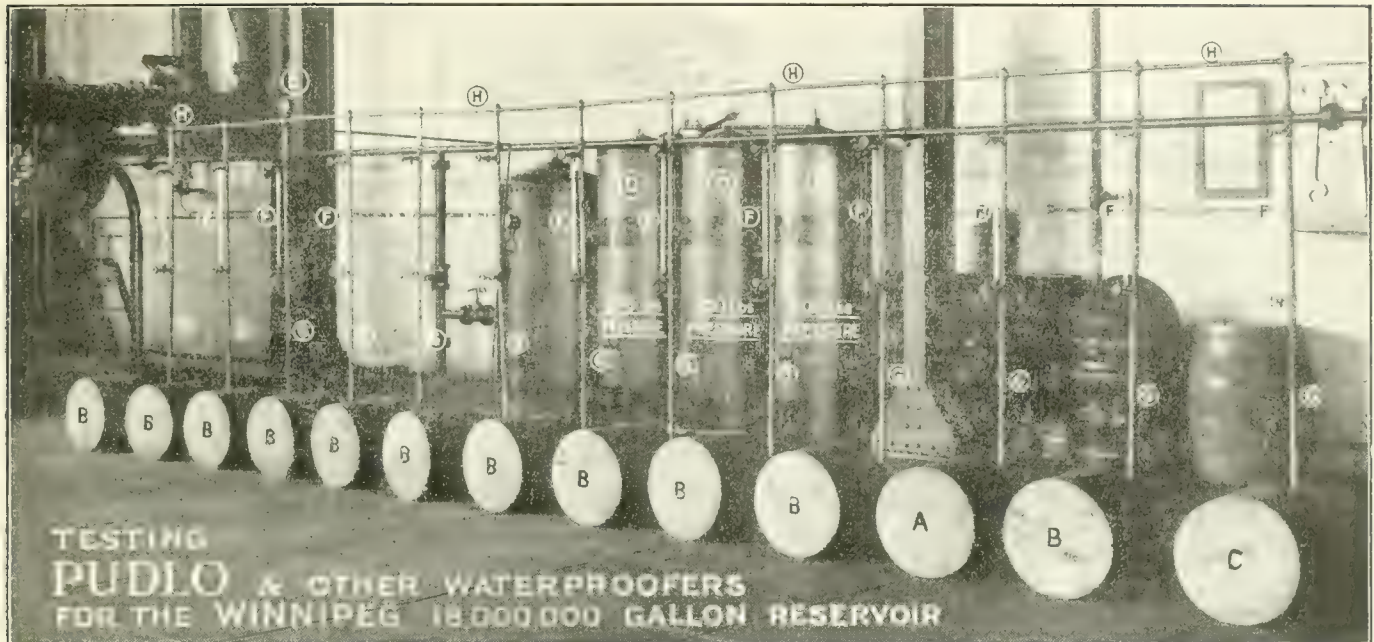


Photo showing exhaustive tests made by City of Winnipeg

**MAKES CEMENT  
WATERPROOF**

# “PUDLO”

**MAKES CONCRETE  
WATERPROOF**

**Key to Test.**

- A—Cask of PUDLOED Concrete mixed to maker's specifications.
  - B—Eleven casks of other waterproofings.
  - C—One cask of 1, 2 and 4 aggregate; no waterproofing.
  - D—Tanks of compressed air used in test and maintained at 200 lbs. per inch.
  - E—Indicator registering even pressure to 140 lbs. per inch.
  - F—Glass tubes to show absorption in each mixture.
  - G—Water service columns.
  - H—Air service pipes.
- Result: After 3 hours' test the Pudloed concrete alone did not show any leakage.

- “PUDLO” proved superior to all other methods.
- “PUDLO” thus secured order for 68,250 lbs. waterproofing.
- “PUDLO” cannot fail when used to specifications.
- “PUDLO” waterproofs permanently.
- “PUDLO” is used by Canadian, British and Foreign Governments.
- “PUDLO” is used by R.R. Co.'s Contractors, etc., everywhere.

*“PUDLO” Booklet and  
Sample on request to:*

**The W. H. Thornhill Co.**  
160 Princess Street, Winnipeg

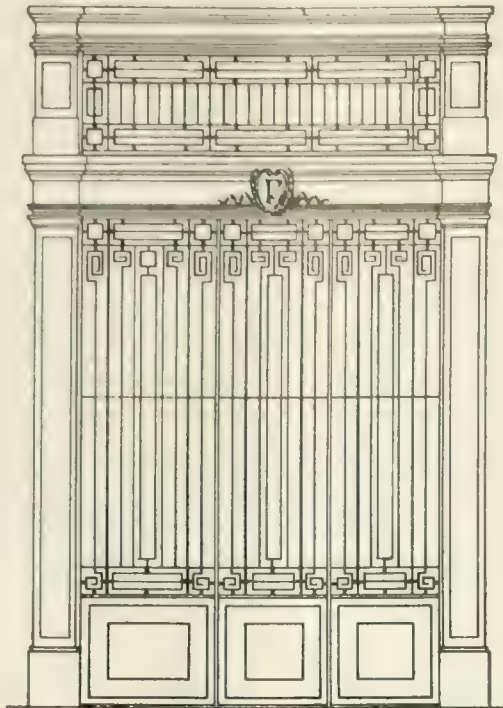


Photo showing end of 18,000,000 gallon Reservoir for City of Winnipeg when Pudlo was used, after above tests.



# BUILDERS

Ornamental  
Iron and  
Bronze for  
Theatres  
Churches  
Stores



# BUILDERS

Wire and  
Iron  
Time Savers

Ask for a copy of our  
Portfolio of Building  
Details in Iron.

*The Dennis Wire & Iron Works Co. Limited*  
LONDON - CANADA



Architectural Ironwork.

North Wing, Ontario Parliament Buildings

For  
Ornamental Iron  
and  
Bronze Work

**MEADOWS SETS  
THE STANDARD**

Our products are backed by our  
reputation and our prices—right

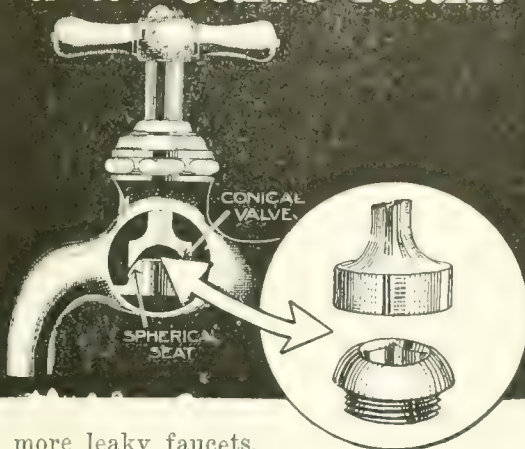
Send for *our* estimates

The GEO. B. MEADOWS Toronto  
Wire, Iron & Brass Works Co.,  
Limited

479 Wellington St. W.  
Toronto, Ont.



# At last, a faucet that can't leak!



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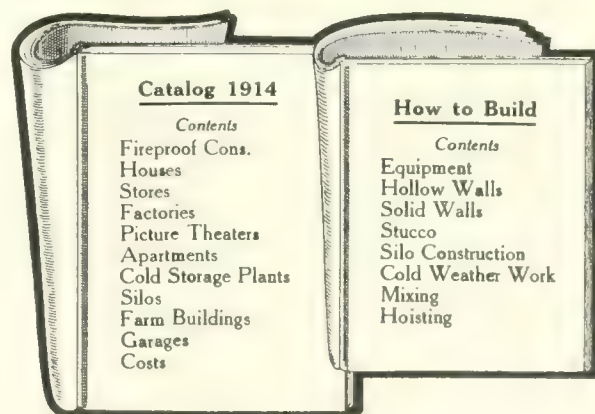
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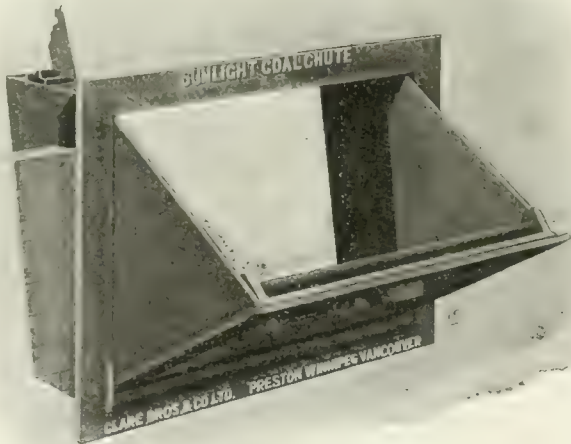
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## FOR THE CONVENIENCE OF READERS

Until the Directory is extensive enough to give you what you desire, we will be glad to have readers write us for names of Architects, Patent Attorneys, Engineers, etc., whom we can recommend.

¶ For your convenience we are devoting this page to this "Professional Directory;" and in each issue we hope to see an added number of Professional Cards in this department. When you wish plans prepared—when you have an idea you wish to patent—form the habit of looking at this page in The Canadian Builder and Carpenter.

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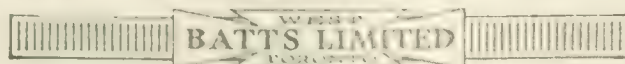
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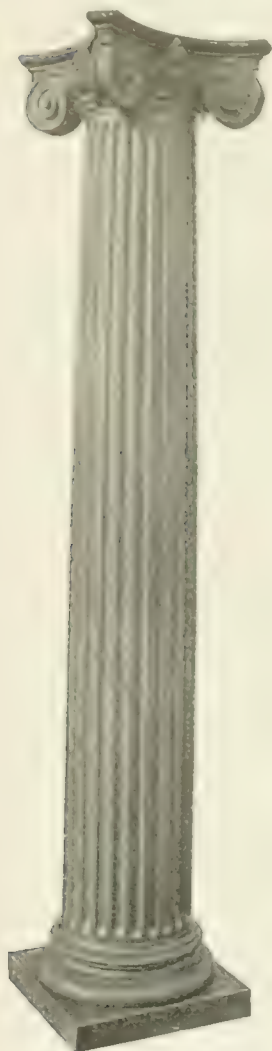
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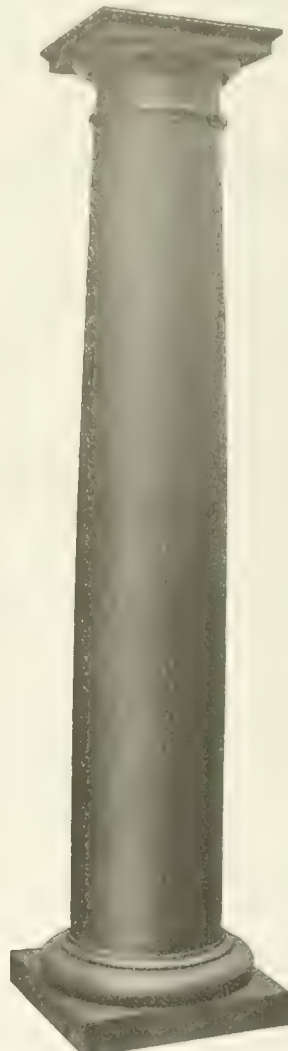
Design B.L. No. 5

Length	Diameter—	5in.	6in.	8in.	10in.	12in.
4 ft. Price	\$3.10	\$3.35	\$4.20	\$6.10	\$9.00	
5 ft. Price	3.40	3.70	4.40	6.90	9.55	
6 ft. Price	3.70	3.95	4.55	7.20	9.85	
8 ft. Price			5.30	9.10	10.95	
9 ft. Price			5.75	9.65	11.75	
10 ft. Price			6.10	10.00	12.30	



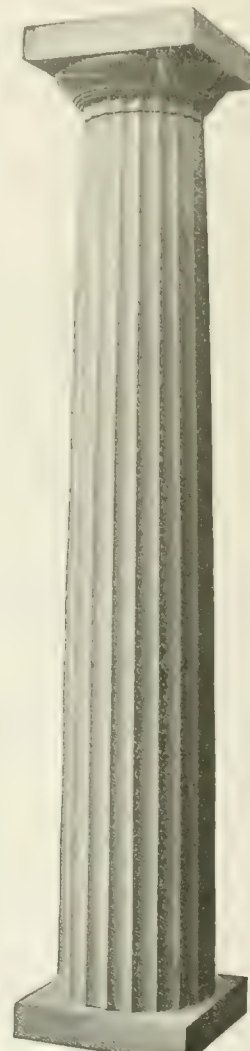
Design B.L. No. 4

Length	Diameter—	5in.	6in.	8in.	10in.	12in.
4 ft. Price	\$2.60	\$2.80	\$3.70	\$4.75	\$8.00	
5 ft. Price	2.85	3.10	3.85	5.00	8.50	
6 ft. Price	3.10	3.30	3.95	5.15	8.75	
8 ft. Price			4.55	5.95	9.75	
9 ft. Price			4.95	6.50	10.50	
10 ft. Price			5.20	6.75	11.00	



Design B.L. No. 1

Length	Diameter—	5in.	6in.	8in.	10in.	12in.
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5 ft. Price	1.85	2.00	2.40	3.25	5.50	
6 ft. Price	2.10	2.20	2.50	3.40	5.75	
8 ft. Price			3.10	4.20	6.75	
9 ft. Price			3.50	4.75	7.50	
10 ft. Price			3.75	5.00	8.00	



Design B.L. No. 6

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3 ft. 0 in. x 7 ft. 0 in.	1 1/2 in.	Price 9.00	4.50



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2 ft. 10 in. x 6 ft. 10 in.	1 1/2 in.	Price 6.25	3.25
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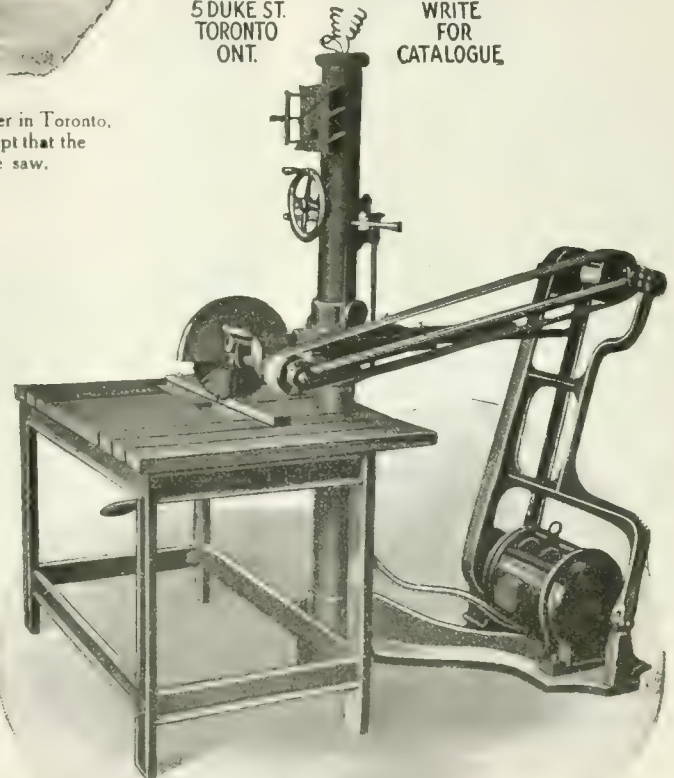
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VOL. 4

TORONTO, JULY, 1914

No. 7

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By E. J. G. Phillips, Chief Engineer Richards-Wileox Canadian Co., Ltd.

How Mortar Affects the Compressive Strength of Bricks.





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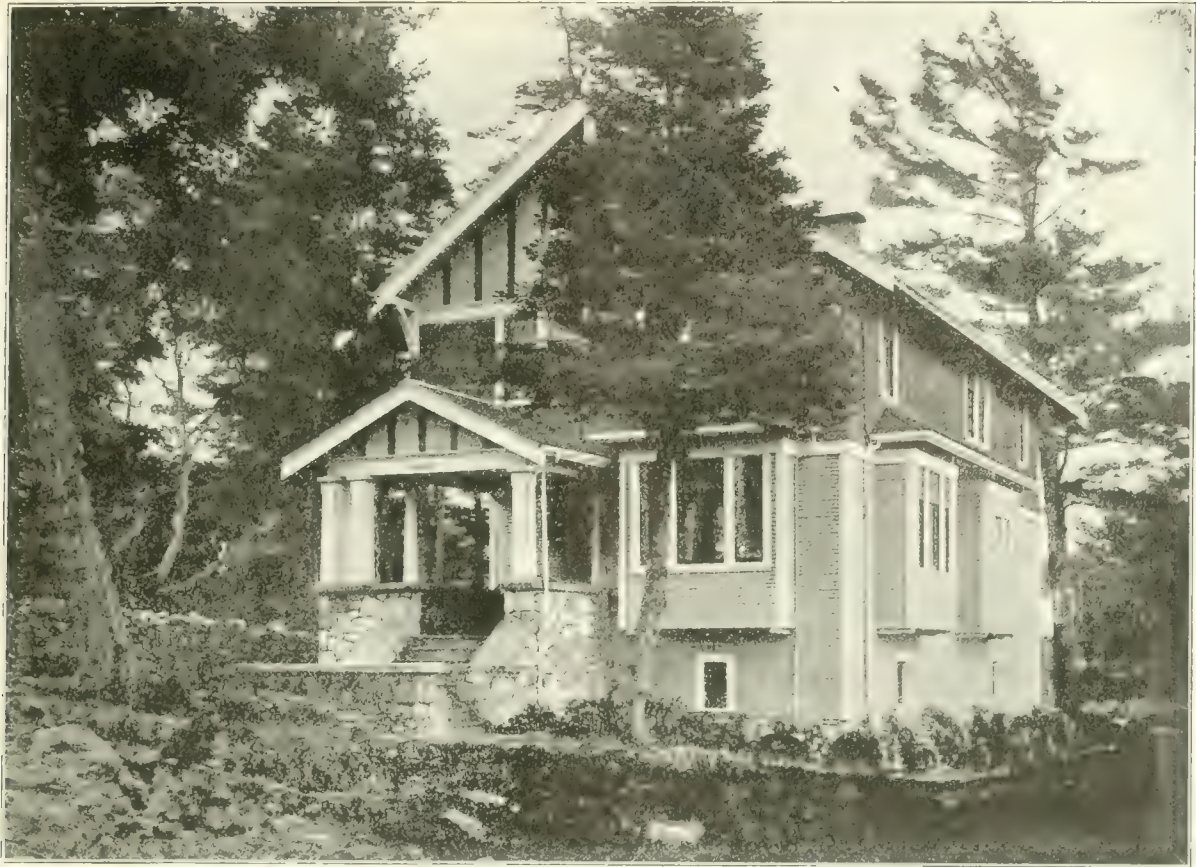
Information Department

# Canada Cement Company Limited

982 Herald Building

MONTREAL





A beautiful home in Victoria, British Columbia, containing many convenient features.

## A Victoria House Containing Many Convenient Features

*This house was built for a home with every modern convenience including food safe, coal chute, wood lift, linen chute, etc. The house overlooks the Straits of St. Juan de Fuca giving a beautiful view of the Olympic Mountains and is worth about \$10,500. The architects were James and James, Victoria, and the house was erected for E. O. Weston, Victoria.*

STAFF ARTICLE

THE house, which is fully illustrated herewith, is a beautiful home located on Redcliff Highland Drive, Victoria, B.C., overlooking the Straits of St. Juan de Fuca, giving a magnificent view of the Olympic Mountains and the sea. It is built on a lot 60 x 190 ft., and is worth about \$10,500.

Many valuable features have been included in its design, and the exterior finish gives a first impression of a comfortable home, and a visitor is not disappointed when he enters the house.

The foundation of the house is of granite and concrete, with granite foundation and walls on the verandah. This arrangement gives the entrance a very pleasing appearance, the stone colors being particularly effective in this respect. The first storey is of "clapboard," while the second storey is shingled. The gables are paneled and filled in with stucco.

### Kitchen "Safe," or Outside Cupboard.

Among the many inexpensive devices for the convenience of the housewife is a kitchen "safe." This safe is simply an outside cupboard, opening from the pantry, having screened openings at the top and bottom to give a circulation of air. The shelves are made of slats 1¼ in. thick, and fastened to a frame, which

allows them to be taken out for cleaning. There are two doors, top and bottom, the lower portion being used for vegetables and large articles, the upper part for butter, fruit, etc., etc. These safes are very generally used in, as they make it unnecessary to use ice, especially when placed in a shaded part of the house.

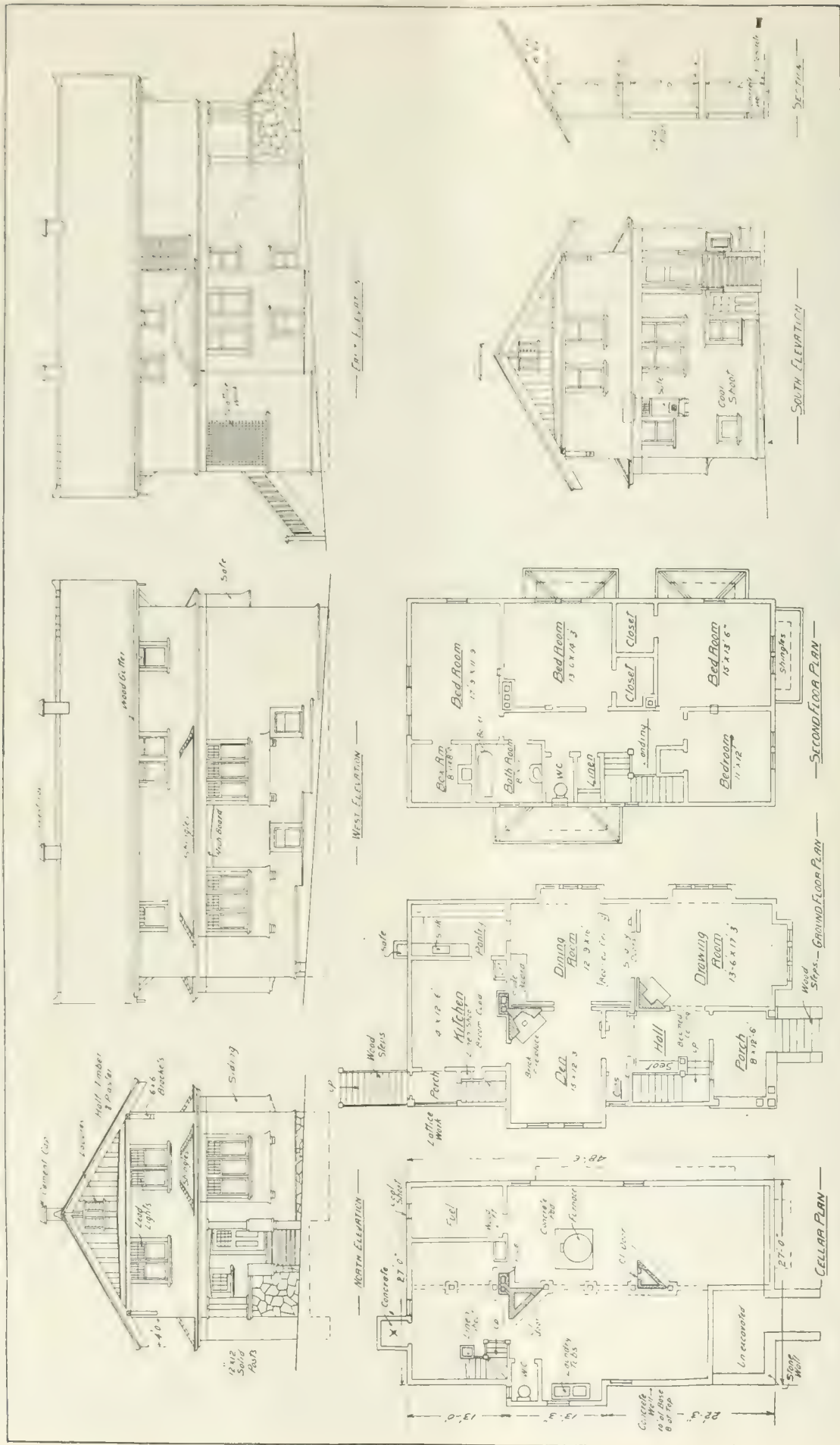
### Wood Lift From Basement to Kitchen.

For ease in conveying wood and coal from the basement to the kitchen for use in the range, a wood lift has been installed. This lift is a contrivance in the shape of an elevator, boxed in at the back, with a small windlass. It is used to lift the wood, kindling, and coal from the basement to the kitchen. It opens into the kitchen by a small door in the wall. This is a convenient arrangement, and saves a lot of muss in the kitchen, as it takes the place of a woodbox, and, of course, kept closed when not in use. The windlass is set up in the basement.

### Linen Chute From Bathroom to Basement.

It is not necessary to carry down clothes in this house, as a linen chute has been installed. This linen





Plans, elevations and section of Victoria house described in this issue of The Canadian Builder & Carpenter.





Den showing paneled wall and plate rail.



Drawing room showing bay window and window seat.

chute is a box arrangement running through from the bathroom on the second floor to the laundry room in the basement, with a door in the bathroom and another in the kitchen (small door or opening) to permit the conveyance of soiled linen to the laundry room, without having to carry it through the house.

#### Coal Chute Saves Windows.

A coal chute has been installed for conveying the coal to the coal bin, which is completely partitioned off from the rest of the basement, thus effectively preventing the dust from circulating throughout the basement. The coal chute saves the basement window, making it unnecessary to paint it each spring to cover

up the damage and dirt caused by receiving the winter's coal supply.

A number of other features include the broom cupboard in the kitchen, beamed ceiling in the dining room and hall, sliding doors between dining room, den, and drawing room, arrangement for ash removal from fireplaces, etc. The ashes drop to the basement, where they are deposited in ash vaults. Cast iron doors give an entrance to them when it is desired to remove the ashes.

Other special features may be seen by a reference to the plans and photographs. One photograph shows a built-in buffet in the dining room bay, which necessitated a slight alteration in the plan, which will be understood by a study of the photograph.



Dining room with built-in cabinet, door with leaded lights between dining room and pantry, beam ceilings and paneled walls, etc.



# Beautiful Toronto Hollow Tile Home With Stucco Finish

*Hollow Tile Advancing in Canada—Plans and description of a well-arranged home in Toronto's suburbs—Contains many good features, including built-in furniture, numerous fireplaces, sleeping porch and garage*

STAFF ARTICLE

**H**OLLOW tile for house construction is making rapid advances in Canada. In the United States many fine houses have been constructed of this material, but it is only within the past two or three years that Canadian builders have used it for dwellings.

On the adjoining page are shown photograph and floor plans of R. J. Dilworth's residence on the banks of the Humber River, in the suburbs of Toronto. It is constructed entirely of hollow tile and finished on the exterior with stucco. For the basement, 12 in. tile

and the five bedrooms open off this. There are two bathrooms, one on each side of the stairway. Besides having the usual three pieces, each is equipped with a shower.

A feature of the house is a large sleeping porch on this floor, entrance to which is had from three of the bedrooms.

The trim throughout the house is in Georgia pine, with oak floors downstairs and birch floors on the first flat.

## A Garage in the Rear

A roomy garage has been built underneath the verandah at the rear, and driveways leading to this have been constructed all around the house.

Edmund H. Yeigh, Toronto, drew up the plans for this house, and the carpentry work was done by the Canadian Construction Co., who also had general supervision over the whole job.

— — —

## Erect Buildings Which "Fit in" with Those on the Street

Reasons for erecting buildings which "fit in" with those already erected on a street are set forth in a Montreal newspaper, and while it refers to Montreal and vicinity only, might be read with interest by builders throughout Canada:

Montreal does not begin to "look the money that is in it."

The building operations in this city have cost a great deal of good hard money; but the architectural advice on which much of it has been spent has been so bad that it does not "show" its value.

This can be seen on almost any street where recent buildings have been erected. We did much better in the old days when the plain but effective grey stone front—so characteristic of Montreal—was in evidence, even on the less pretentious thoroughfares.

Westmount and Outremont have set us splendid examples. The general architecture of these two suburbs, though marred by some misfits, is commonly excellent.

But, in Montreal itself, the work of the architect is altogether too haphazard. As we have said, money enough is often expended, but amateurish architects are permitted to play pranks with all the standards of beauty and grace—to give full rein to a freakish fancy—or opinionated owners interfere with their architects with lamentable results.

It is impossible, of course, to interfere with the freedom of private taste. The man who is paying the piper may call the tune—even if it be "rag-time." But there ought to be a department of architecture in our civic government, which could, at least, give advice, and which could induce some attention to what may be called "street architecture." If we can legislate against the erection of fire-traps, and even of houses below a certain cost in certain localities, why can't we insist



Residence of R. J. Dilworth, Esq., Baby Point, Humber Valley Survey Toronto

was used, with 8 in. above that. The roof is of asbestos slate, and the chimneys are built of natural stone brought from the Humber valley.

The rear of the house faces the south, and the long, narrow plan was adopted in order to secure the maximum amount of sunlight for the various rooms.

## Basement Contains Boiler and Vegetable Rooms

While the floor plan of the basement is not shown, it contains the usual boiler room, fruit cupboard, vegetable room, a couple of store rooms, and an immense billiard room, with lavatory accommodation off the latter.

Hot water heating is used, and twin boilers, one large and one small, are located in the basement.

A dumb waiter extends from the cellar to the top floor, through the kitchen.

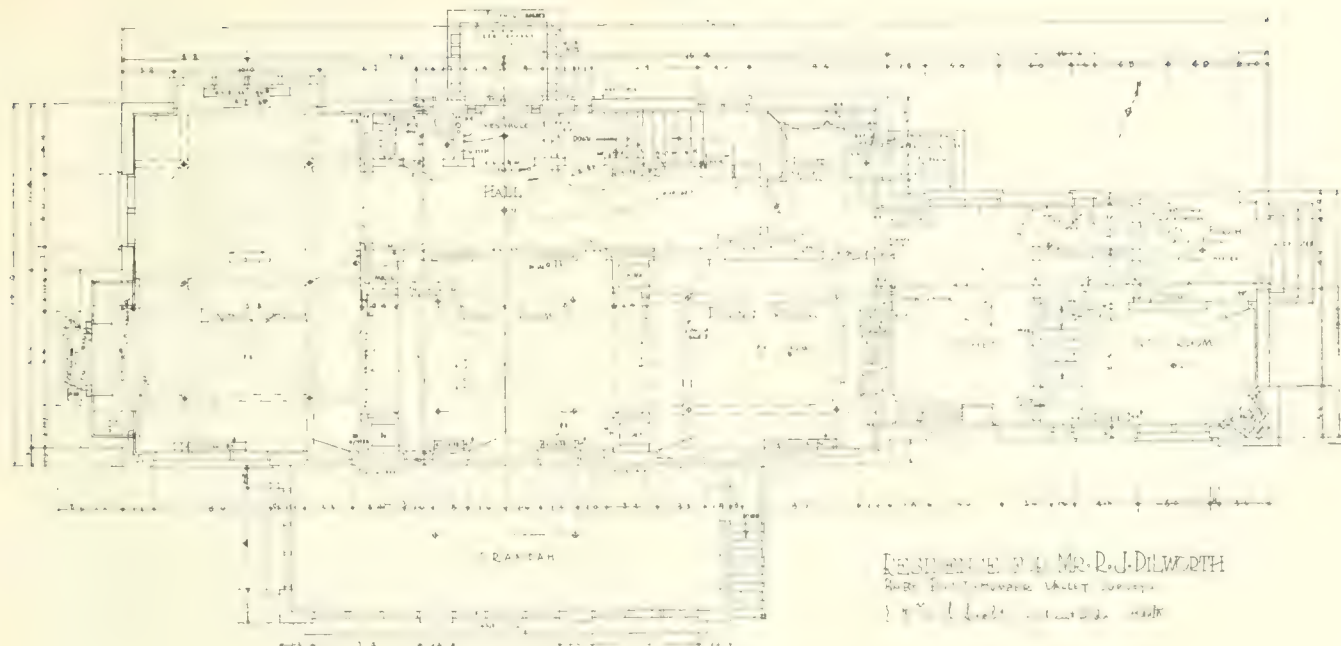
## Large Rooms on Ground Floor.

It will be seen that the rooms on the ground floor are all of good size and well arranged. Much built-in furniture has been put up on this floor, including book shelves in the hall, music room and living room, china cabinets in the dining room, and cupboards in the kitchen.

## First Floor Contains Large Sleeping Porch.

A wide hall runs almost the full length of this floor,





Ground floor plan of R. J. Dilworth's residence

that buildings, erected on any given street, shall pay some attention to the style and height of the buildings already standing on that street?

A little foresight and good taste can give us a beautiful city here, architecturally. The continued lack of it will give us a series of "botches," of which we will be heartily ashamed, and which will drive away rather than attract new settlers, new investors, new industries.

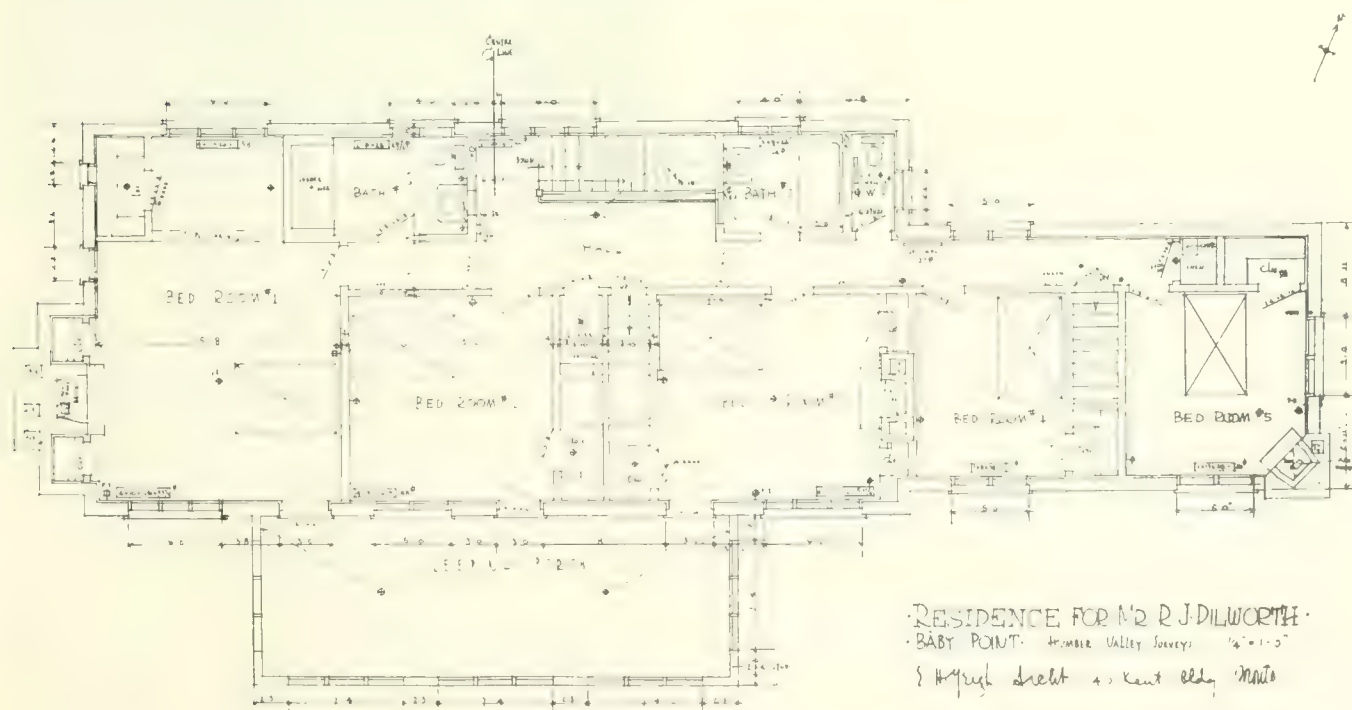
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## Strongly-Built Sidewalk Sheds Prevent Accidents

The value of strongly-built sidewalk sheds was re-

cently demonstrated at the new Equitable building in New York City, when a derrick with a heavy load of structural steel fell across a sidewalk shed. The accident occurred shortly after noon, when the street was crowded. Not a person under the shed was seriously hurt, as the stout structure withstood the terrific impact of the falling derrick and the heavy girder it had been lifting.

In Montreal and Toronto this practice of using sidewalk sheds has been adopted. They are essential where derricks carry steel beams and other materials over the heads of pedestrians, and rules regarding the use of such structures should be made general among Canadian builders.



First floor plan of hollow-tile dwelling



# Public School of Design out of Ordinary for Rural Districts

*This school at North Grimsby is constructed of red pressed brick, and is of a design not usually found outside the larger towns and cities. Many schools will be built during vacation, and this one offers suggestions that might well be adopted.*

STATE ARTICLE

WE publish herewith floor plans of a school that is a particularly good design for a rural district. It is located at North Grimsby, Ont., and the plans were drawn up by Joseph Daw, architect, St. Catharines, Ont.

Messrs. Nye & Gordon, Grimsby, Ont., were the contractors for the masonry work, and Henry Marsh, also of Grimsby, handled the carpentry.

The accompanying photograph shows the building to be of red pressed brick on a concrete foundation below the grade. The concrete for the foundation is a mixture of 1 part cement, 3 parts sand, and 5 parts broken stone.

## Playrooms on the Ground Floor.

The plan shows the ground floor to be divided into a furnace room and two playrooms—one for girls and one for boys—for use during bad weather. The furnace is a warm air one.

The furnace room is fitted with a fireproof door, constructed with three thicknesses of  $\frac{7}{8}$  in. tongue and groove hemlock and hung on an inclined rail.

The concrete floors on the ground floor are 2 in. thick and are composed of 4 in. broken stone and gravel. The mix is proportioned 1-3-5, with a top coat of one part cement and two parts sand. The finishing coat is colored to match the adjoining stonework.

The joists are 16 in. centres, and all are bridged at 10 ft. centres, with a double row of 2 x 2 in. herring-bone bridging.

Partitions are set and framed with 2 x 4 in. studd at 16 in. centres.

All openings have 3 x 8 in. lintels.

## Materials of Construction on Top Floor.

All the materials on the top floor of the classroom are of No. 1 maple or beech. The window frames, sash, and trim are of pine.

All the under floors are  $\frac{7}{8}$  in. spruce, T. and G., beading, flooring, and the whole of this floor is covered with sound-deadening felt and  $\frac{7}{8}$  x  $2\frac{1}{2}$  in. maple flooring.

## Interior Trim of Pine.

The entire trim is of pine. All the walls of the first floor have  $\frac{7}{8}$  x 8 in. base,  $\frac{1}{4}$  in. round,  $\frac{7}{8}$  x 4 in. chair rail, and  $1\frac{1}{2}$  in. picture mould.

The stairs are constructed as follows:  $1\frac{1}{8}$  in. treads,  $\frac{7}{8}$  in. risers, and  $\frac{7}{8}$  in. cove. The string is supported on 2 in. x 6 in. carriage places, 16 in. on centres. The handrail is 3 x 4 in., and the newels 3 x 4 in., with plain tops and bases. The treads are of hardwood, and the rest in pine.

## The Roof and Belfry.

Every precaution has been taken to prevent fires. The roof is covered with asbestos shingles, and all ceilings are of metal.

The belfry is formed with 2 x 6 in. posts,  $\frac{7}{8}$  in. hemlock sheeting, and  $\frac{7}{8}$  x 5 in. louvres. The cornice is

formed with 2 x 4 in. brackets,  $\frac{7}{8}$  in. fascia, soffit, and bed mould. One of the louvre panels is constructed so as to form a door to the roof.

Window sills throughout the building are of 5 x 9 in. cut stone, rocked face, and tooled tops.

## Ventilation of a Barn

Am planning a barn 30 x 48 feet, with self supporting hip roof. No purlines will be used. Posts 18 feet, and containing stable with 10-foot ceiling. (1) What pitch should the rafters be? (2) What length should the rafters be? (3) How much cement and gravel will be required for the floor? (4) What is the best way to drain gutters during cold weather? (5) What should be the length of stall for horses and cattle? (6) How best to ventilate barn?—T. S. E., Dauphin, Man.

Answer: From your sketch I do not think it advisable to use the kind of roof that you suggest, as with no

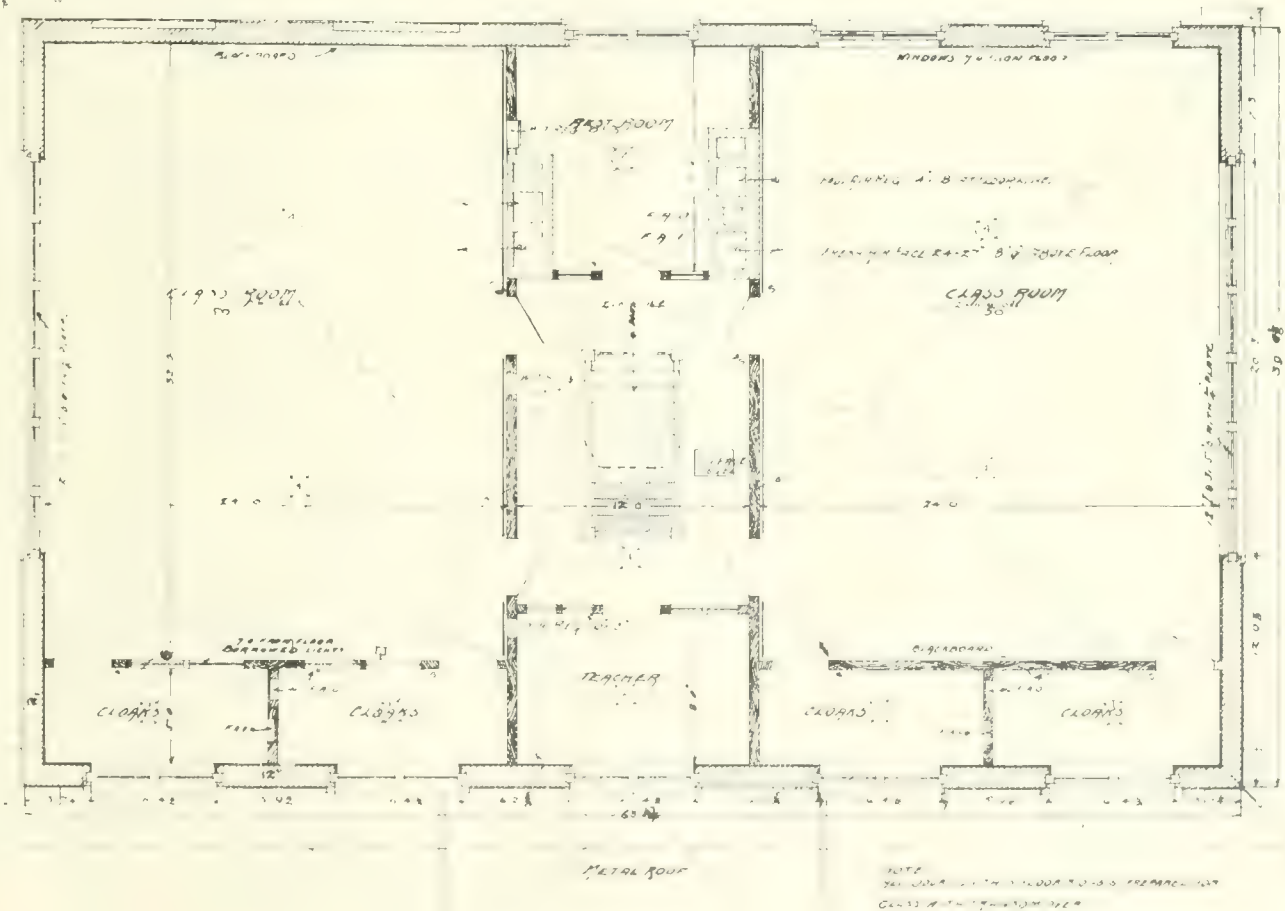
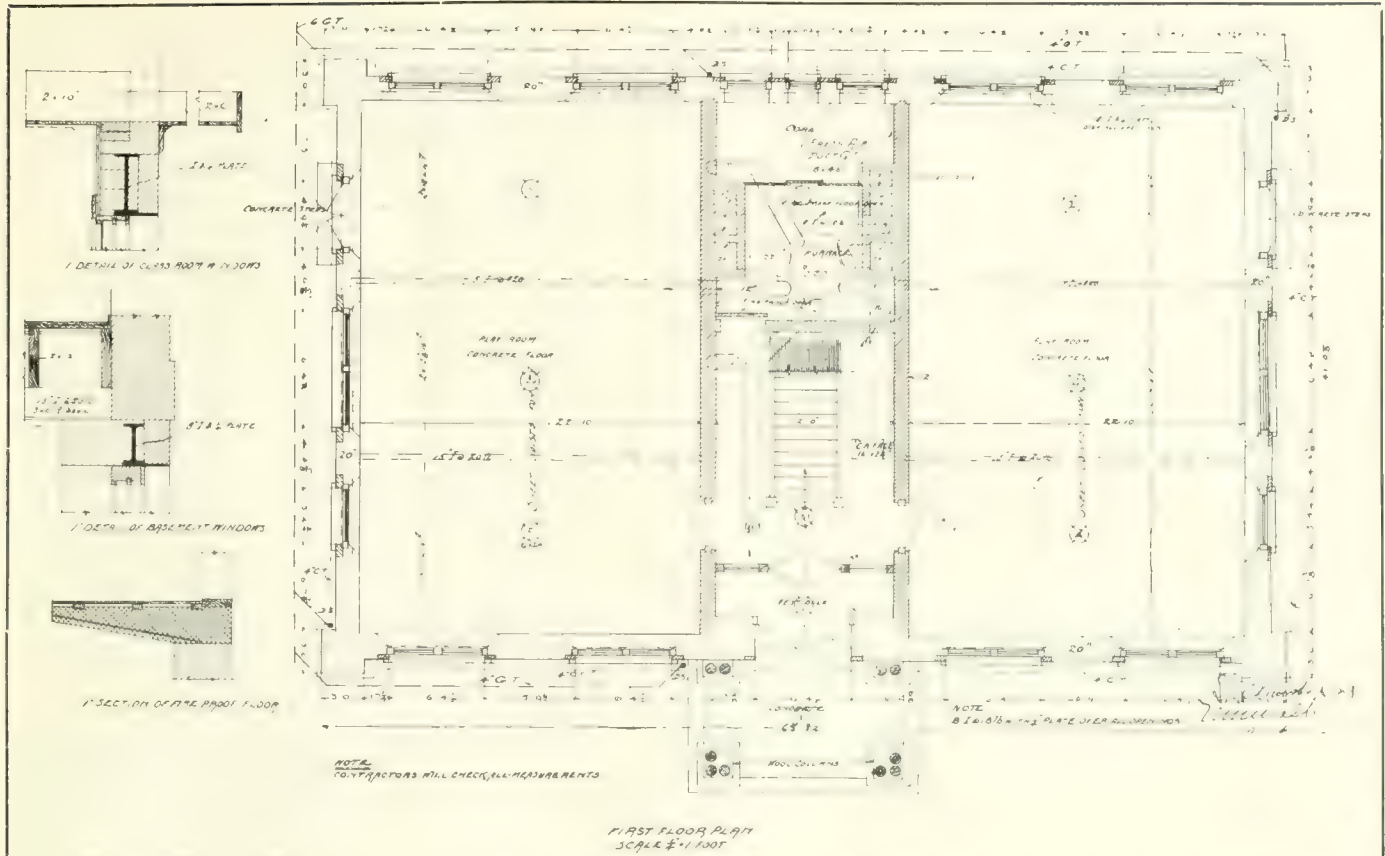


School house at North Grimsby, Ont., constructed of red pressed brick.

support for the roof except the walls, and with nothing to tie the walls together, closer than eight feet to the plates, the weight of the roof would spread the sides of the building. By putting braces on the sides of the rafters you will have very little more room in the loft than if the rafters were straight.

(1) Give the lower part a pitch of 60 degrees and the upper a pitch of 30 degrees. (2) For a width of 30 feet make both upper and lower rafters 10 feet long exclusive of projection. (3) It will take 25 barrels cement, 7 cubic yards of gravel, and 7 cubic yards of sand. By screening the sand and gravel and using the right proportions, gravel will be found to give as good satisfaction as if crushed stone was used. (4) Do not drain them at any time, but absorb the liquid with straw, sawdust or muck. One can always find some spot that would be greatly benefited by the liquid as well as the solid manure. In fact, it is the more valuable of the





Ground floor and first floor plans of the back school at North Grafton, Ont.





## Frame House with Sleeping Porch and Built-in Furniture in Many Rooms

On this and succeeding pages are published floor plans, elevations, and sectional details of a frame house built for H. L. Beatty, Welland, Ont., containing many valuable features, which should appeal to the up-to-date builder.

ground floor, and separate bathroom and water closet on the first floor, laundry in rear of kitchen, and built-in china cabinets, bookcase, and kitchen cupboard.

### Details of China Cabinet and Bookcase.

The space behind one of the stairways leading to the first floor has been made to accommodate a built-in bookcase and a china cabinet, the former in the den



Front elevation.



Rear elevation.

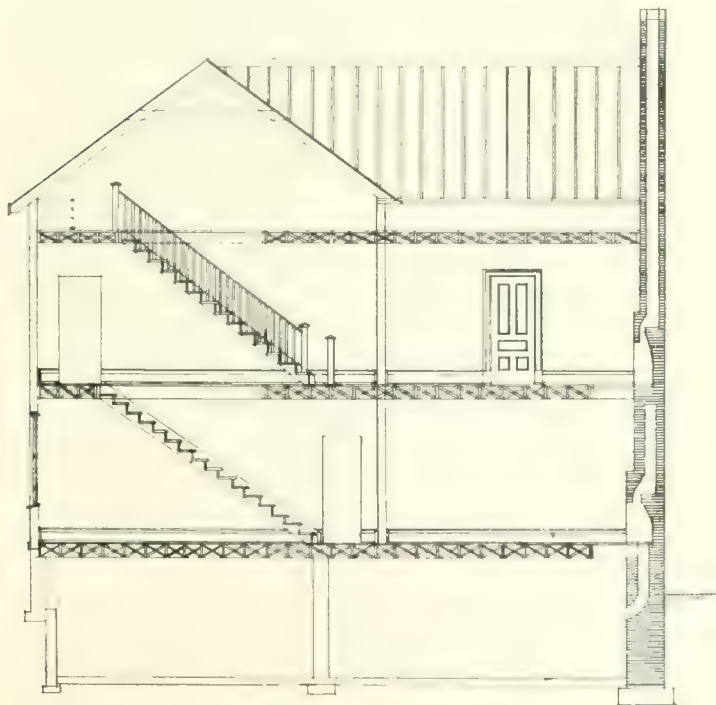
H. L. Beatty's residence.

Probably the best features about this dwelling are the simple lay-out and the size of the rooms. It is typical of the better type of frame house, which is being erected in towns to-day.

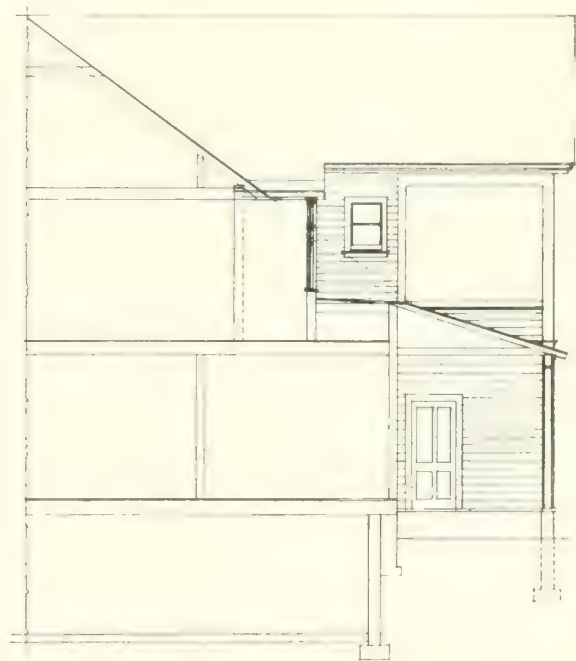
Other features include sunroom and sleeping porch at the rear of the first floor, complete bathroom on

and the latter in the dining room. The plan shows the arrangement.

The face of the china closet is Georgia pine, enamelled white, and the doors are of leaded glass. The bookcase is constructed of quarter-cut oak, with plain glass doors. It is built of  $\frac{7}{8}$  in. material.



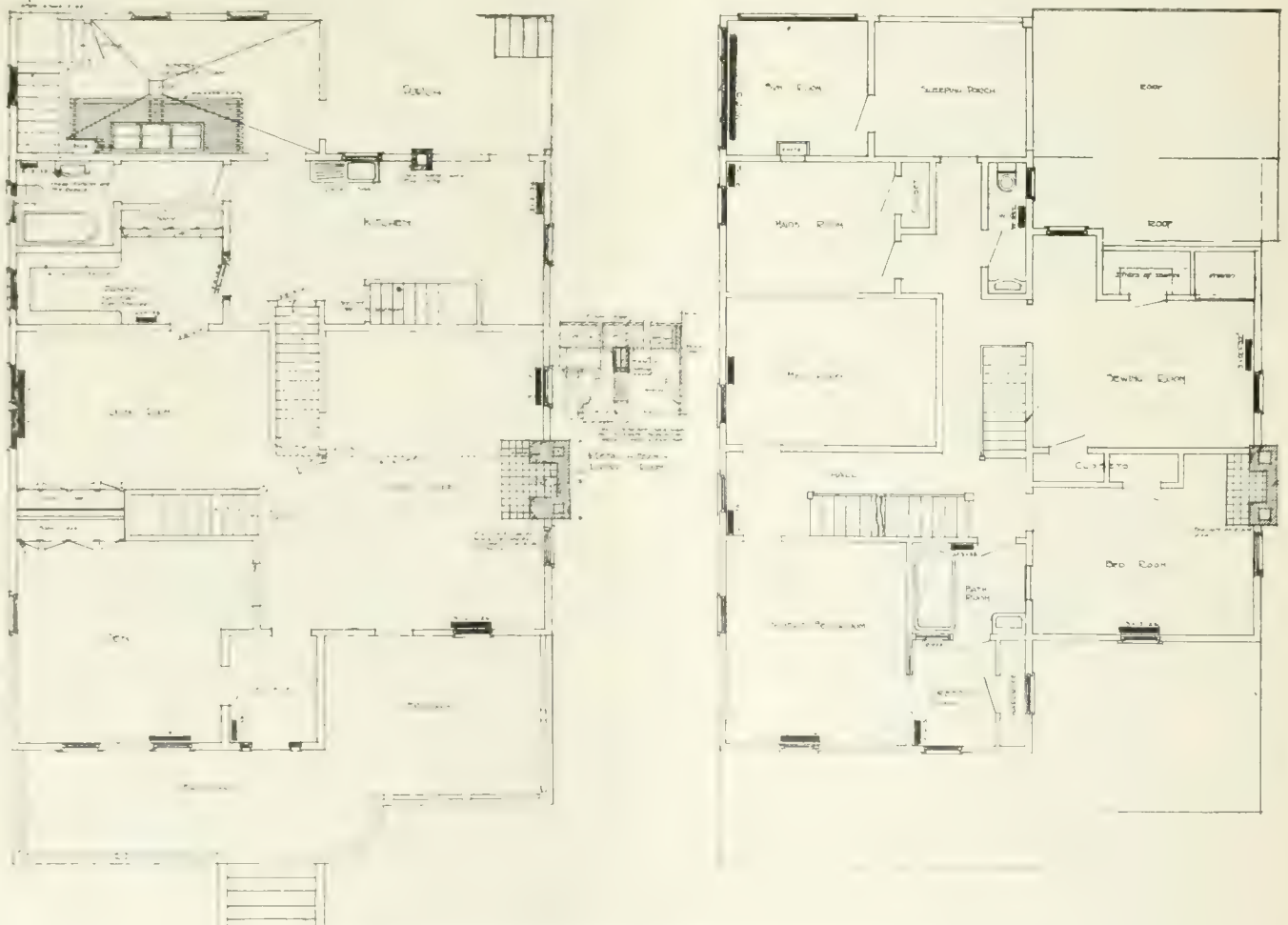
Cross section



Section.

Details of frame house erected in Welland.





Floor plans and side elevation of H. L. Beatty's residence, Welland, Ont.

### Laundry in Rear of Kitchen.

The laundry at the rear is equipped with permanent tubs, set above removable slats. The floor is of concrete.

### A Well-equipped Kitchen Cabinet.

The kitchen cabinet is 7 ft. 6 in., and fits into a niche in the wall of the pantry. It is built of Georgia pine, with leaded glass doors in the upper half. Flour bins have been built at either side on the lower portion, and the space between is taken up with several drawers for linen, cutlery, etc. Then, of course, there are lower cupboards for pots and pans. The doors on this part are moulded and paneled.

The pantry has four tiers of shelves all the way round the three walls.

### Built-in Drawers in Sewing Room

In the sewing room a chest of drawers has been built in the wall to one side of the clothes closet, and they go through into the clothes closet. These drawers are finished in aromatic cedar.

A clothes chute runs from top to bottom of the house and empties into the laundry.

Corrigall & Forbes, Welland, Ont., were architects for this dwelling.

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## Satisfactory Design of Bungalow

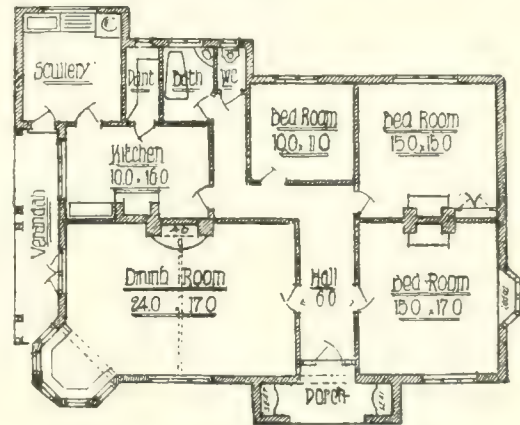
The accompanying illustration shows plan and elevation of a Canadian bungalow. Writing to the National Builder, a Toronto reader states: "I know this bungalow quite well, having occupied it for some time, so would know its faults, if it had any. It can easily be changed if necessary. It would cost from \$1,500 to \$2,500, but could be built for less if made somewhat smaller, which might easily be done without doing

harm to the building, as it would leave the rooms sufficiently large for ordinary purposes."

"A verandah added to the side would make the din-



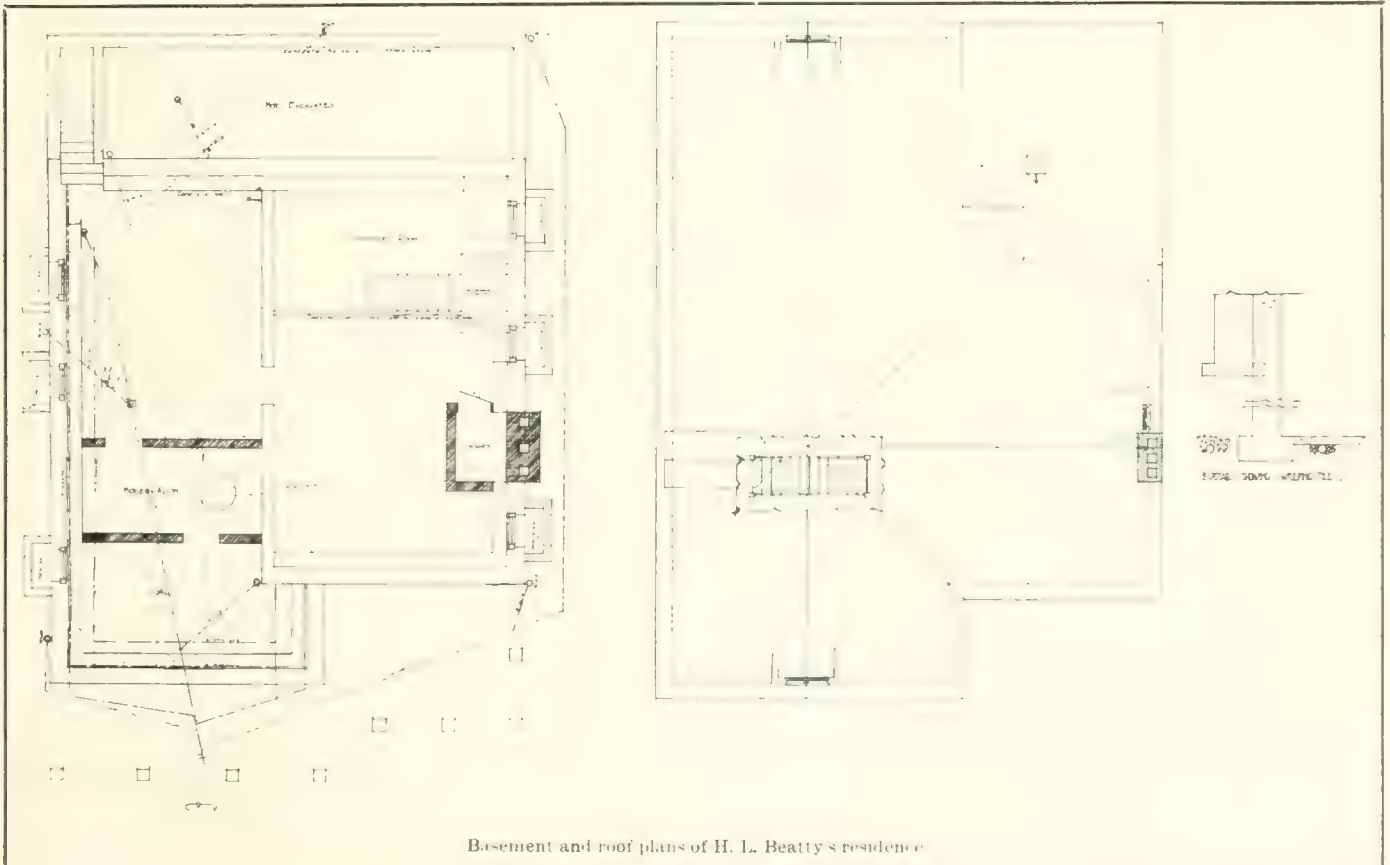
Front Elevation



Plan.

Canadian bungalow of satisfactory design.

ing room a very pleasant room. The entrance is bold and will look well. If built of mottled bricks, it would have a fine rustic look, and the entrance porch could be given a quaint English appearance."



Basement and roof plans of H. L. Beatty's residence



# Questions with Answers of Interest to Builders and Carpenters

*Inquiries received from subscribers are printed herewith and answers from our readers are requested. The answers contain the same numbers as the questions, to make reference easy. All replies accepted for publication will be paid for at our regular rates.*

ANSWERS ARE BY SUBSCRIBERS

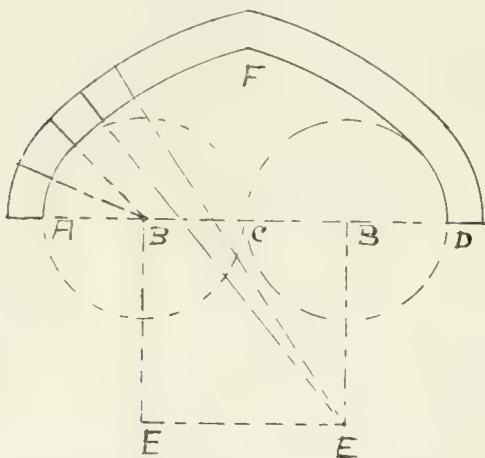
**D**URING the summer months many builders meet subscribers which others have overcome. It would take the latter only a few minutes to answer the questions asked by builders through The Canadian Builder and Carpenter, and they would, in addition to making a dollar, confer a favor on other builders, which would be much appreciated.

**39. Estimating Nails Required**—Some time ago I read with interest an article in The Canadian Builder and Carpenter on the right nails to use on various jobs. I would appreciate it if the writer of that article would enlarge it and show us how to estimate the number of nails to use for various work, such as flooring, roofing, sheeting, shingling, etc.—Nova Scotia Reader.

**40. Glue Information Wanted**—Will you inform me how I can tell when I am getting a glue of good quality and how glue may be most economically used, such as the best methods of heating it, the proper temperature to which it should be heated, etc.—“Inquirer,” Eastern Ontario.

## Question 7—Four-Centre Arch.

In answer to “Young Spread,” the accompanying figure shows a four-centre arch. A. D. being plan and C. F. the rise, two of its centres, B. B., being on the



“Ontario” method for striking a four-centre arch.

spring line, and the other two, E. E., being below it. The joints are drawn, as shown, from the points B. and E.—Ontario.

## Question 27—Damp-proof Floors.

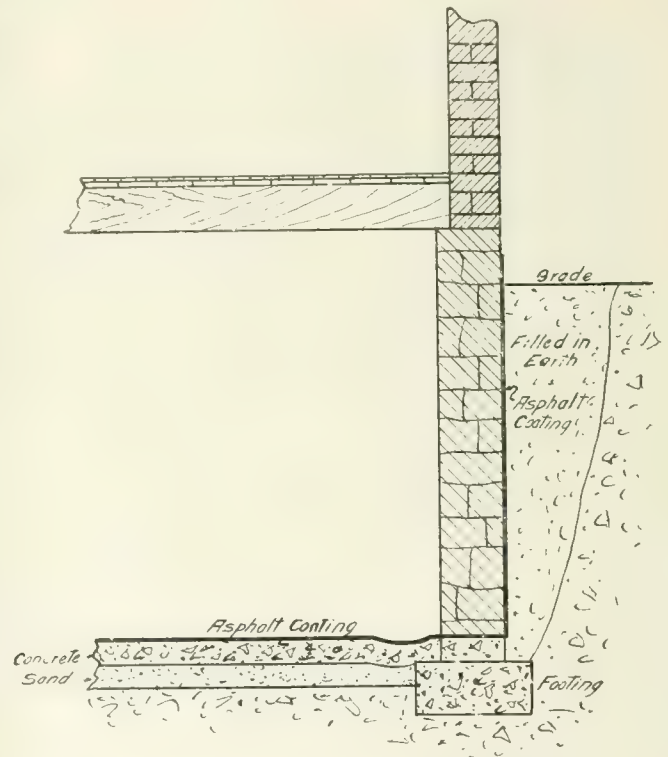
Accompanying is a sketch of how a floor may be made damp-proof. A coating of 4 or 5 ins. of sand is laid and carefully worked down. The gutters may be formed as shown. Over this is laid a layer of 2 or 3 ins. of cement concrete, and, when dry, is given two coats of hot asphalt, which is carried across the footing as shown, and may be continued up the outside of the foundation wall to, or above, the grade, if so desired, thereby making the walls damp-proof as well.

## Question 36—Cleaning Brickwork.

To clean old brickwork, the best way is to scrub it down thoroughly with a good stiff wire brush, plenty of water, and lots of “elbow grease,” and then brush it down with a solution of muriatic acid. I recollect seeing a wall cleaned down by two men, who, instead of using a brush, used an ordinary brick for rubbing down. I would suggest that after cleaning down, that the joints be raked and neatly pointed. John Webb.

## Question 36—How to Clean Brickwork

In answer to E. A. F.’s query re cleaning of brickwork, any mortar that has adhered to wall may be removed with a good stiff scrubbing brush. To take out



Details showing how a floor may be made damp proof.

mortar stains the walls are washed with a solution of muriatic acid, in the proportion of about one part of acid to twenty of water, applied with good stiff brush. I have seen this used and can vouch for it doing the trick properly.—Jinx.

## Question 38—Estimating Paint

The following are the yards super, which a fixed amount of materials will cover in each coat. These are arrived at by measurement of actual work done:

First, or priming, coat, to cover 63 super yards: 10 lbs. white lead, 1 oz. red lead, 2 ozs. litharge, 4 pints raw linseed oil.

Second coat, to cover 100 super yards: 10 lbs. white lead, 2 ozs. litharge,  $2\frac{1}{2}$  pints linseed oil,  $1\frac{1}{2}$  pints spirits of turpentine.

Third or fourth coats: 10 lbs. white lead, 2 ozs. litharge, 2 pints linseed oil, 2 pints spirits of turpentine.—A. J. Dixon.

#### Question 38—Estimating Paint.

According to one authority on estimating, 1 lb. of mixed white lead paint will cover  $4\frac{1}{2}$  yards super. the first coat and  $6\frac{1}{2}$  yards super. second coat. On cement work, 1 lb. of mixed white lead paint will cover 1 yard super. Much depends on the composition of the paint. Adulterants are used in some brands of paint, which affect the covering power greatly.

It is claimed by some people that paints with a zinc white base cover better than those with a white lead base.

Most reputable paint-makers guarantee their pro-

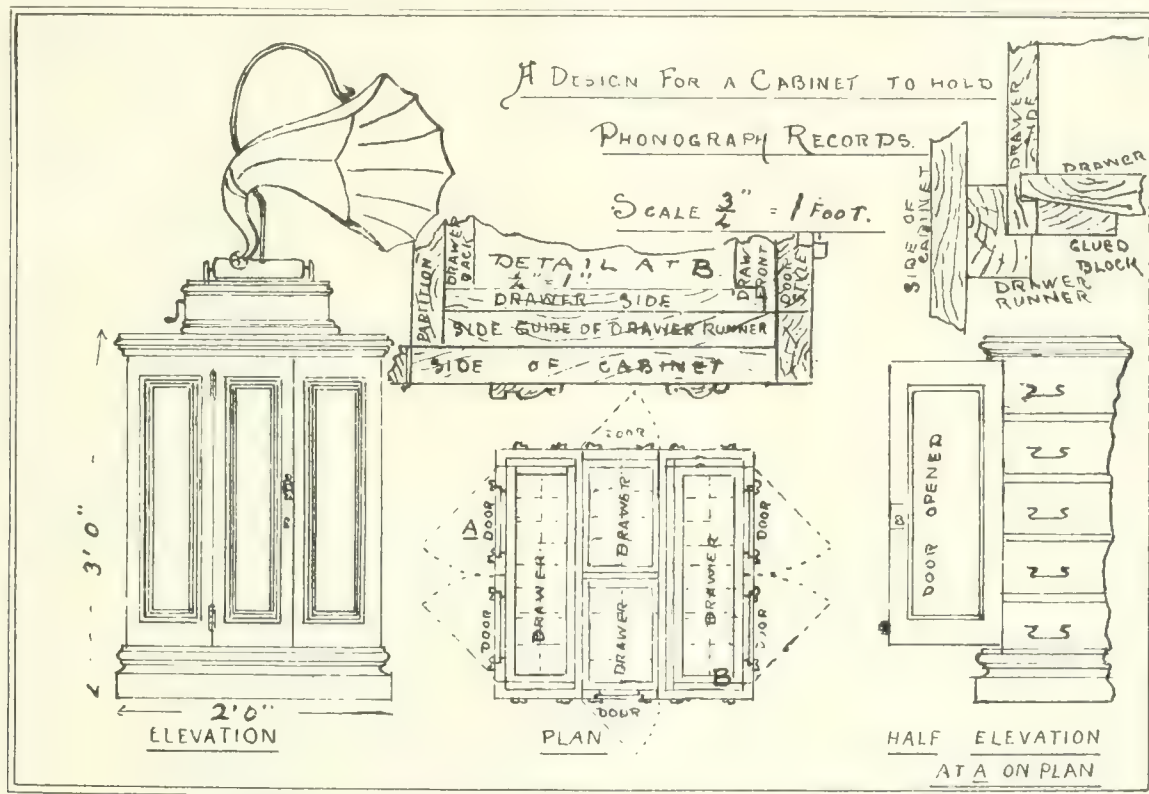
will give the number of gallons of paint required.

For example: Suppose your building measures 20 feet wide, 30 feet long, and 20 feet high, the result will be: Front, 20 feet; back, 20 feet; 1 side, 30 feet; 1 side, 30 feet; total, 100 feet. Multiply by height of 20 and you have 2,000 square feet. Divide 2,000 by 250 and the result is 8. You will need 8 gallons of paint.—Jinx.

#### Question 35—Record Cabinet.

The accompanying sketch illustrates a record cabinet, which I hope will suit J. O'H. I would suggest that the cabinet be made of the same kind of wood as the motor base of his instrument, and also the same finish. The drawers should be set out to hold records standing on end in their cases, without being too tight. Give just enough space to pack comfortably. The record case which I measured was  $4\frac{3}{4} \times 2\frac{5}{8}$  in.

In this design the moulds are planted on the face and



Details which show how to construct a cabinet for talking machine records.

ducts to cover a certain area. So, if you are in any doubt, why not choose a good brand of paint, and write the manufacturers for particulars?

Also, a great deal depends on the painter. One man may make the same amount of paint cover half as much again as another man.—John Webb.

#### Question 38—Estimating Paint

The following to my mind is about the best method for outside measurements: Measure the length, width, and height of the building, add together the total number of feet in the two sides and two ends, then multiply this amount by the number of feet high, which will give you the total amount of square feet to be painted. Make no allowance for doors or windows; figure as if for solid surface. Divide the total number of square feet by 250, which is about the number of square feet one gallon of paint will cover in two coats. The result

give a raised effect similar to a bolection mould. The doors are rebated to take the panels, and the mould covers the joint. The rebated drawer runner is used so as to permit a  $1\frac{3}{4}$  in. door jamb being used. Put four good blocks under the bottom at the corners to take casters.

The cabinet is 3 ft. high and 2 ft. square,  $\frac{7}{8}$  in. stuff for carcass, partitions, drawer front, and door rails and styles,  $\frac{5}{8}$  in. stuff for drawer sides and backs, and  $\frac{3}{8}$  in. stuff for drawer bottoms and door panels. Set back the face of the drawers from the backs of the doors to allow for drawer handles.—John Webb.

#### Question 40—Information re Glue

Glue is graded by the manufacturer in some cases by viscosity and in others by the stiffness of the jelly.

Viscosity of a glue means its body or thickness, and has nothing to do with its specific gravity with which



some people confuse it. To determine the viscosity of a glue, a constant volume of a solution of the glue is allowed to flow out of a small opening in the containing vessel. The time required to empty the vessel is a measure of the viscosity.

A glue to be tested may be compared with a standard glue, or a glue whose value is well known to the user, by making two solutions having the same percentage of glue, one from the standard glue and the other from the unknown glue. Each of these solutions is tested for viscosity as previously explained. The one having the greatest viscosity, that is, the one requiring the greatest time to flow out of the vessel is the best glue.

To test the stiffness of the jelly, portions of these solutions are allowed to come to a standard temperature, forming a jelly, and the weight required to force a plunger through each sample of jelly is found. The greater the weight required to force the plunger through the jelly the better the grade of glue, and the greater will be the adhesive power. In making this test, care should be taken to have the temperature constant, as one degree will make a difference of two pounds in the jelly strength.

These methods of testing will take considerable more time than most builders are prepared to spend on such a question, and the results obtained will not be very accurate until he has had considerable practice, so the best way to obtain glue of good quality is to buy from a reliable dealer.

Economical use of glue requires careful attention as to temperature and length of time heated. The quality of the glue deteriorates if heated for too long a time. The quality of a joint made by a 12-cent glue after it has been under the action of heat for ten hours is no better than a joint made from a fresh batch of 8-cent value. It is therefore advisable to have equipment arranged so that only a small amount of liquid is on hand at one time.

The best temperature for using glue is between 140 and 160 degrees F. Since the glue should not be heated above 160 degrees F. and the temperature of boiling water is 212 degrees F., it will be readily seen that the glue may easily be overheated even when immersed in water.

The maximum hardness of glue is seldom reached before 48 hours, so that, to obtain the best results, work should be left to set from 24 to 48 hours; certainly not less than 8 to 12 hours.

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## Catalogues and Price Lists Wanted

The London and Contracting Co., 401 Richmond street, London, Ont., has been organized to carry on a general contracting business, and will be glad to receive catalogues and price lists from the different manufacturers.

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## E. J. Curry with W. J. Hynes, Limited

Mr. Ed. J. Curry, plastering contractor, and a prominent member of the Toronto Builders' Exchange, has been appointed vice-president of W. J. Hynes, Limited, Toronto, contractors for plastering, modeling, designing, and relief decorating.

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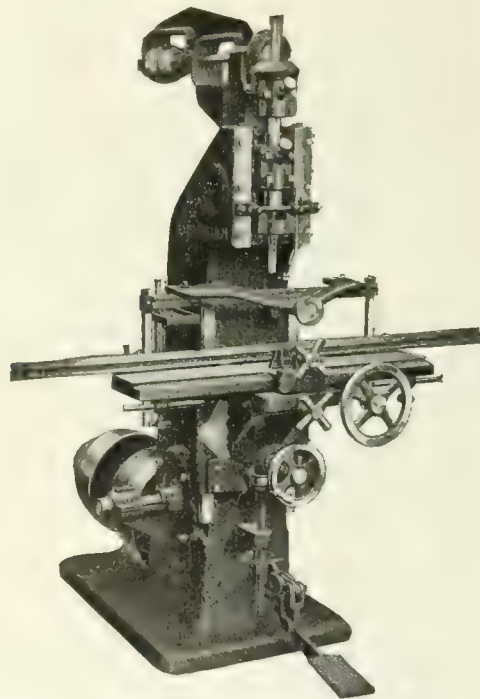
The 1915 convention of the Canadian Society of Domestic, Sanitary and Heating Engineers will be held in St. John, N.B.

## New Equipment

### Vertical Hollow Chisel Mortiser

In the workshop of the Toronto Technical School a vertical hollow chisel mortiser, which is used for similar work as that required for making doors and windows of all kinds, and general mortising work. This mortiser contains several special features of interest. The chisel descends to the work, which assists in securing accurate work. This is an especially useful arrangement, particularly for long material, which overhangs the table, since it can be supported by means of a temporary trestle.

The machine has a capacity for mortises up to  $\frac{3}{4}$  in. square in hardwood or 1 in. in soft wood by  $3\frac{1}{2}$  in. deep. The chisel ram reciprocates with quick return, in gibbed ways, with provision for taking up wear, and is arranged with an adjustable chisel-holder. It operates automatically by foot treadle. The speeds of the



Automatic Chisel Mortiser such as has been installed in the woodworking department of the Toronto Technical School, manufactured by the American Wood Working Co., for whom the Stuart Mfg. Co., Winnipeg, are agents.

chisel are 10, 20, and 35 strokes per minute. The stroke is adjustable from 0 to 4 ins.

An adjustable hold-down close to the chisel prevents the lifting of the stock on the return stroke.

The bit spindle is driven by noiseless mitre gears, doing away with the troublesome idler for the right angle drive. The speeds of the spindle, corresponding to the feeds of the chisel ram, are: 2,000, 2,800, and 3,600 r.p.m.

The table is securely gibbed to the frame and is adjustable vertically by hand wheel. It can be tilted to

an angle of 30 degrees to the right or left, and will allow a mortise to be made in the centre of material  $5\frac{1}{2}$  in. wide by 12 in. deep. It is also adjusted to and from the column. It is provided with a detachable plate under the chisel, which can be replaced with wood or soft metal for through mortising.

An adjustable back-guide and hold-down is provided with spring spacing stop-gauges, which can be set for several mortises and different lengths, thus saving time otherwise consumed in marking off each piece to be mortised.

There is also a line-gauge attachment which can be used with or without the spring stop-gauge, and which will be found to be very convenient when making mortises that have to be marked off as in long material where the spring stop-gauges cannot be used.

The mortiser was manufactured by the American Woodworking Machinery Co., Rochester and Toronto, the Stuart Machinery Co., 674 Main street, Winnipeg, being agents.

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## Steel Mitre Box with Excellent Features

The accompanying illustration shows a steel mitre box with many excellent features. The bed is constructed of bar steel and is shaped in the form of a truss, thus being strong and rigid. The back is of heavy corrugated steel. The serrated steel plates covering the bed and forming the bottom hold the work securely and prevent it from slipping.

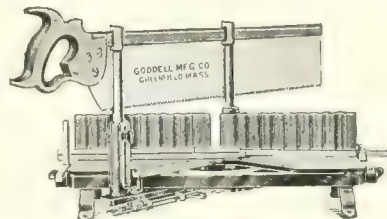
This mitre box is convenient in operation, as illustrated, by some special improvements, including the automatic detents for holding saw elevated, thus allowing the placing of work with both hands. A slight downward pressure releases the saw.

The lever carrying the saw may be swung from 45 to 90 degrees either right or left, and will lock auto-

matically at all the regular, most used angles. It can be locked at any angle shown on the degree scale, by simply pulling forward a small knob on the side of the lever.

Angles more acute than 45 degrees are obtained by the angle attachment, which is also used as a moulding

Steel mitre box manufactured by the Goodell Mfg. Co., Greenfield, Mass.



holder. This, with the length gauge for cutting duplicate parts of any length up to twenty inches, are easily set in position and fastened by means of thumb-screws. These devices are, however, in the form of attachments, which can be quickly removed or replaced by means of four screws.

This steel mitre box is manufactured by the Goodell Mfg. Co., Greenfield, Mass.

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## Catalogue Review

**Hammers of All Sizes and for All Purposes.**—A catalogue issued by the David Maydole Hammer Company, Norwich, N.Y., describes a large and complete assortment of hammers for carpenters, masons, bricklayers, etc. To make the catalogue still more useful, it is printed in English, German, French, and Spanish.

A well fitted-out model bathroom. (Illustration by courtesy of the Standard Sanitary Mfg. Co.)







# Carpentry and Woodworking



## To Find a Required Opening in a Pitched Roof

An opening for a round pipe in a pitched roof or partition at any angle may be found as shown in Fig. 1. Here we have a 6-inch pipe intersecting a two-thirds pitch. A line from 12 to 16 on the square represents the pitch. Now, with 12 as centre and with radius equal to one-half of the diameter of the pipe, draw a circle, and square up from the tongue to the pitch, as shown at B-C. Then A-B represents one-half of the short diameter, and A-C one-half of the long diameter. Now, to make our illustration more clear,

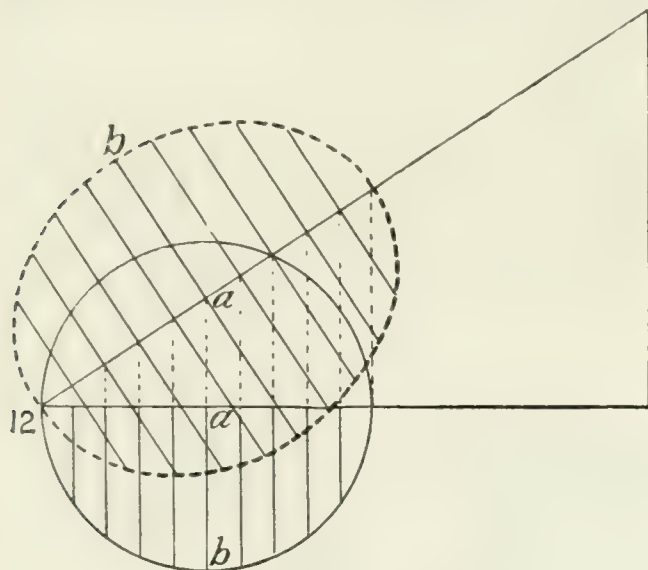


Fig. 1

we will transfer these lengths to a line at right angles with the tongue crossing at 12.

There are several ways of finding the corresponding opening. Probably as good a method as any is that shown in Fig. 2, which is as follows: Take a straight-edge, and on it space off A, B, C, as shown in Fig. 1. Now draw a line equal to the long diameter, C-D, and bisect it at right angles, and to these lines apply the straightedge, as shown in Fig. 2. Always keeping B-C on the lines and marking at A will describe the required opening. The steeper the pitch the longer will be the required opening.

In Fig. 3 is shown the same formula, but with one-third pitch and a 10-inch pipe. Fig. 4 shows another method of obtaining the opening, which is as follows: Lay off the run, rise, and pitch, and with one-half the diameter of the pipe as radius, with the pencil point resting at 12, and centre on run, draw a semi-circle. Divide the diameter into any number of spaces, and through these run lines at right angles with the run from the circle to the pitch. At point of intersection

on the pitch draw lines on either side at right angles and on this measure equal the length of the corresponding lines of the semi-circle, as at A-B. Run an off-hand curve, touching these points, and you will have the required opening.

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## Some Hints on the Construction of a Stave Silo

In the construction of a stave silo a good foundation is an essential. It must be of the right size and before

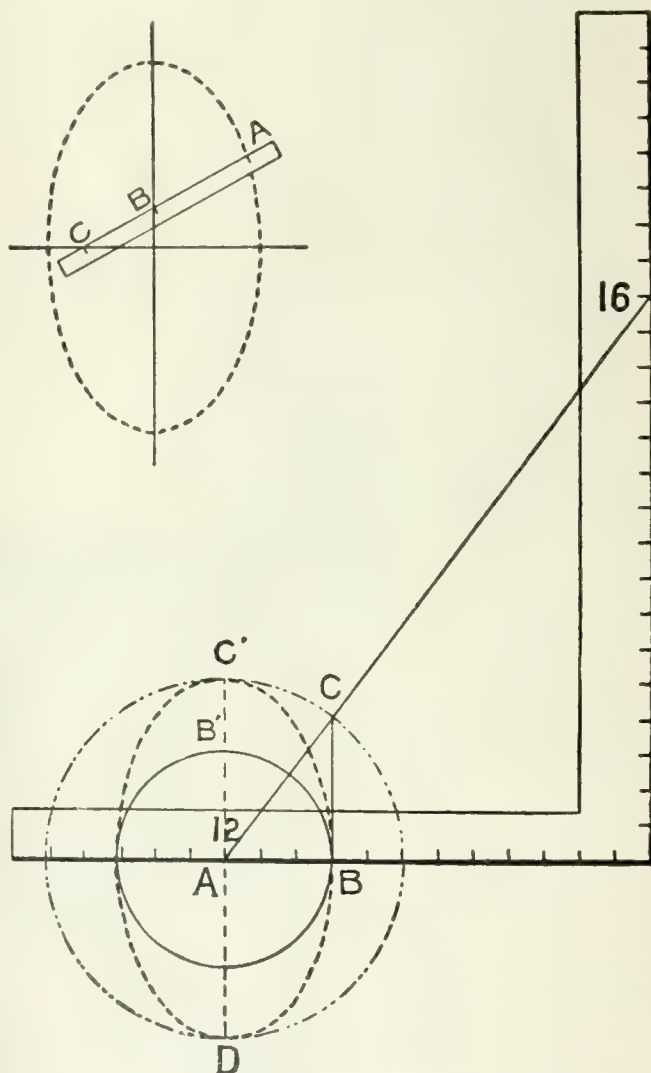


Fig. 1, (Fig. 2 above).

work is begun, this must be determined. The size of the silo should, of course, depend upon the feed which it is required to hold.

The foundation of the stave silo should be two to three feet underground. It is a common mistake to build them without sufficient depth of foundation. A

good plan is to select the centre spot of the foundation and drive in a stake. In the top of this drive a nail. Then take a stick of wood, make a hole in one end to fit over the nail, and measure off, on the stick, just half the intended diameter of the desired silo. Six inches further along the stick, bore a hole and drive in a small stake. When the hole in the other end is placed over the nail a circle may be described on the ground, which will be just one foot bigger than the intended silo. Excavate this to the depth of three or four feet. In the bottom broken stone may be filled, or coarse gravel, to a depth which will give a firm foundation. Over this concrete should be spread, and allowed to harden. After the staves are in place, still more concrete may be filled in to the depth of a few inches. This will serve to hold the staves securely in place at the foundation, and when stones, gravel, and earth are packed around them at the outside, the silo is reasonably safe from blowing over or sagging to one side.

### The Staves.

A stave silo is practically a barrel of enormous size. Hemlock or spruce make the best staves. They may be two inches in diameter and anywhere from four to nine inches broad, but five to six inches, with at least one side dressed, and both edges matched—tongue and groove—fashion is preferable. In addition to this the edges, especially in silos of small diameter, should be slightly beveled, but in silos of large diameter they may be left square. Great care should be taken about the quality of the lumber. Knotty pieces and any with shaky spots in them should be refused.

Staves should be measured to an exact and equal length, and cut square at ends. The

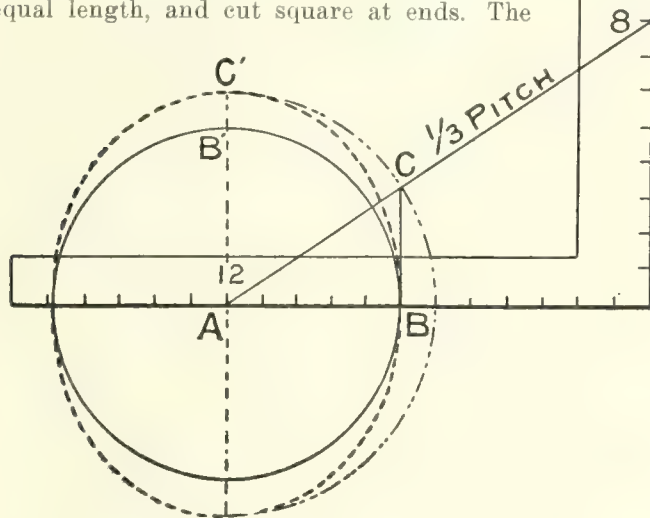


Fig. 3.

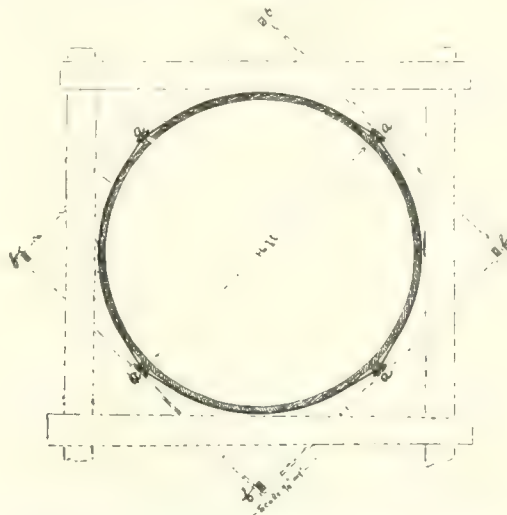
next operation is to bore holes, at distances of 4 to 6 feet apart, along the edges of each. This should be done with a  $\frac{3}{4}$ -in. or 1 in. bit, and in staves of four inches diameter they should be an inch or so in depth up to  $2\frac{1}{2}$  inches in six-inch staves. These holes should be bored so that no hole in any stave will be directly opposite the hole in another stave, but always with a hole somewhere within a foot or so of the bottom and top of each. Care should be taken to bore these holes squarely at right angles with the length of the stave. As the staves are erected to place, spikes are to be driven through these holes into the staves opposite, holding the whole firmly into place. Care should be taken,

however, to avoid driving spikes where the staves are to be cut out for doors.

Sometimes the lumber cannot be obtained of the full length to reach from the bottom to the top of the silo. In this case it is necessary to splice each stave.

### Allowing for Doors.

Before erecting the staves, the question of doors

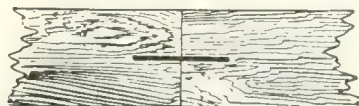
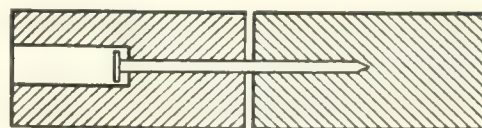
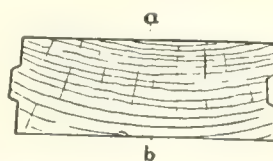


For erecting the staves in position a scaffold made of four corner posts with cross pieces which support planks to stand upon, will suffice.

should be decided and the distance between them. One of the staves should be prepared, the length of the doors measured off upon it and their positions marked. After this is done, make saw cuts half way through it at the top and bottom of each door. These cuts should be made half way through the stave, and at an angle of about 45 degrees, and the doors fitted accordingly.

### Erecting the Silo.

For the erection of the staves a scaffold should be built of four posts, braced and with cross-pieces nailed to them. As the staves are erected, they should be



The upper diagram shows a sectional view of a stave ready for erection. The centre diagram shows method of spiking staves together. The lower diagram illustrates method of splicing ends of staves.

carefully put in their correct place and then nailed, using the holes bored in their edges and nailing with good spikes.

Hoops made from  $\frac{5}{8}$  in. round iron or steel rods are commonly used, and the best method is to use a hoop



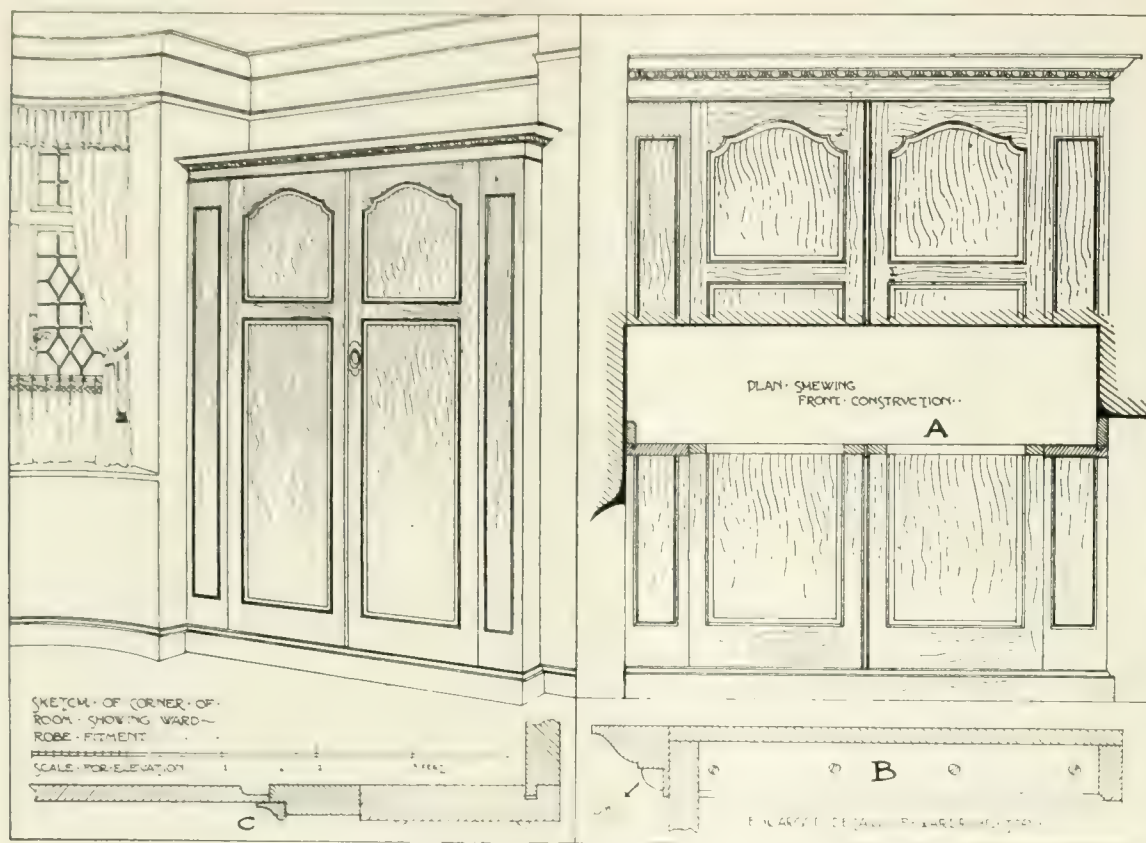
long enough to go completely round the silo, and a metal clip or lug for bolting the ends. Each end of the rod should be threaded for several inches, in order to allow for taking up or loosening, as expansion or contraction in the staves makes this necessary. It is a good plan to place two hoops below the bottom door, and the next hoop 18 inches above it. Toward the top the space between the hoops may be increased, until at the top, a space of three feet may be allowed between them. In building the roof on a wooden silo it is wise to place anchors for guy rods or wires, which will prevent its being blown over when high winds find it empty.

There are many other plans used in the different operations necessary in building the stave silo. Sometimes posts of scantling are used to bolt through instead of steel lugs, but the plan does not work quite so

consequent number of odd corners and half-filled recesses, is not so desirable as good close-fitted furniture with a good, open, airy room.

### Wardrobe in the Bedroom.

In the bedroom, I think a wardrobe such as is illustrated in Fig. 1 economises space, and gives much better opportunities for the display of the most important features, i.e., the dressing table and the bedstead. The general feeling of spaciness is much to be desired. The wardrobe illustrated in Fig. 1 depends much for its effect upon the proportion. It can readily be adapted to fit recesses either wider or narrower than the example shown. The top curve of the door would not give any difficulty, and the pilasters at each side can be made either wider or narrower as required.



Built in wardrobe showing all the details of construction.

well, as the hoops must be made in sections, and a little bit of careless work will soon have the silo badly out of shape.



### Fitted Furniture in the House

The use of fitted furniture in houses of to-day is most successful with "splatted," or "panelled," decorative schemes. In this article it is proposed to deal with a fitted wardrobe. The small suburban or speculative builder usually introduces one or more pieces of fitted furniture, which would be much more satisfactory if much superfluous decoration were omitted. Space is now the chief consideration in well-designed dwelling houses and flats, and in this connection it is interesting to note how well the recesses may be fitted in rooms, thus freeing the main floor area or space. The servant problem is an important factor in house-planning, and most readers will, I think, admit that a multiplicity of pieces of furniture in a room, with the

It will be seen that with an ordinary hanging wardrobe, a front only is really required. There is no special need of ends and back, although, of course, a bottom raised from the floor is an advantage. The plan showing construction (see diagram A in Fig. 1) illustrates the general arrangement of the front frame. The pilasters should be prepared as the first part, then the cornice should be made separately, and a pair of doors, before the wardrobe as such is fitted up from the parts.

### Construction Features of the Wardrobe.

Before dealing specially with the various parts, it may be well to note that the wardrobe bottom can be cut from  $\frac{7}{8}$  in. timber, and arranged to fit into grooves made inside the pilasters. It would be supported on the three sides of the recess by means of fillets resting on the floor and attached to the walls. To consider the various pieces in order, the cornice will first receive

attention. A sectional plan of this is shown (see diagram B).

The pent rail should be made with a return at one end, for which a tongued mitre joint is suitable. Moulding is then glued round, as indicated in the diagram, projecting above the rails in order to make a rebate for the dustboard. An egg and tongue moulding is introduced as a decorative member. This pent should be of composition, and may be obtained in "compo" or "stucco" from regular plaster or composition workers. Alternately, a carved moulding should be introduced, which may be either machine-made or hand-cut. The latter is preferable, as the edges are much sharper than the machine moulding, and consequently a better appearance is obtained. A small moulding is indicated, which should be rebated into the bottom of the cornice.

The dustboard indicated would, of course, be fixed after the remainder of the wardrobe had been fitted up. The pilasters should run from immediately below the cornice to the floor, and the re-

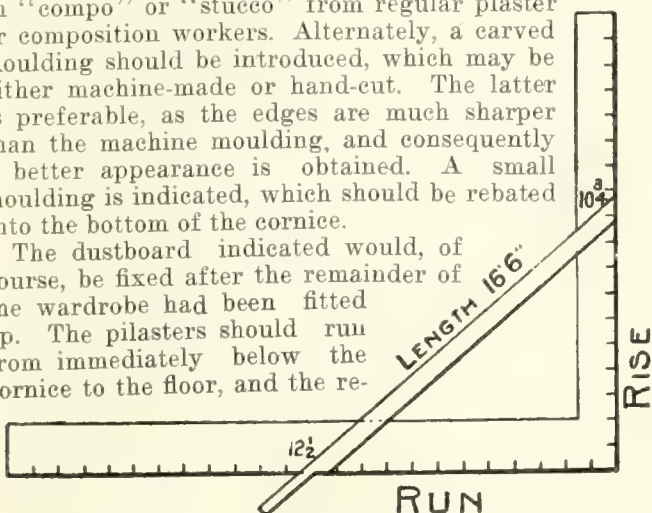


Fig. 1

turns should be attached, as is shown in the plan, diagram A. Both are grooved to receive bare-faced tongues on the returns, the left-hand return only being necessary for purposes of fixing. On the front small astragal mouldings are applied to give the paneled effect. The doors should be made with ordinary "stuck" mouldings, united with a moulding plan on the straight lengths, and with a scratch stock for the curves. A small "ogee" or "ovolo" would be quite suitable for these doors. An alternate treatment is indicated in the enlarged section (see diagram C in Fig. 1). Doors of this type are made with long and short-shouldered

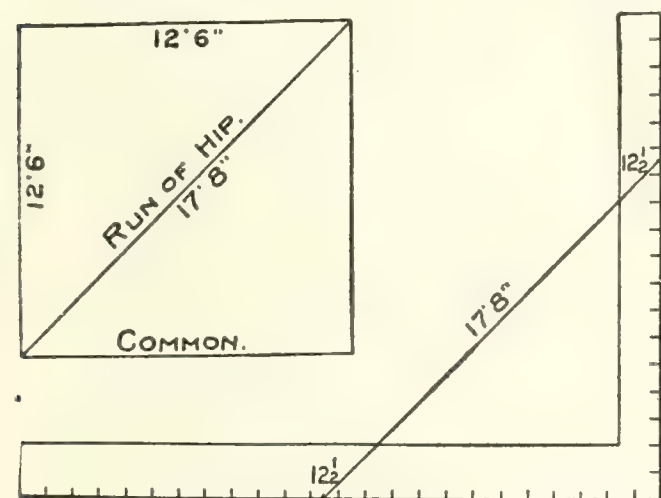


Fig. 2.

mortise and tenon joints, the front edges being moulded to receive separate mouldings.

Where machinery is available and the work is to have a painted finish, the doors can well be put together with three straight rails, and the top rails cut after the doors have been glued up. The rebates are then

worked on the spindle machine, and the corners finished by hand with chisels. When fitting the parts up, the pilasters should first be cut square at the bottoms and top and grooved on the inside to receive the bottom. The top line of the latter should coincide with the skirting line, so that it gives a level surface when fixed. The bottom being scribed and the fillets fixed to receive it, the pilasters can be fitted over and secured to the walls. On the left-hand side the screws should go through the fillet, and on the right-hand side pocket-screwing should be employed.

### Care Should Be Taken to Make Parts Square.

The next step is to fix the fillets to receive the dustboard, and the cornice should then be doweled in order to get the front exactly square, and when erected the skirting boards can be fixed all round preparatory to fitting and hinging the doors. On the inside provision must be made for hanging garments, and a shelf at the top is useful for hats, trouser presses, and the like. Three wide fillets should be fixed about fifteen inches down from the dustboard to receive a shelf, and a strong  $\frac{1}{4}$  in. brass

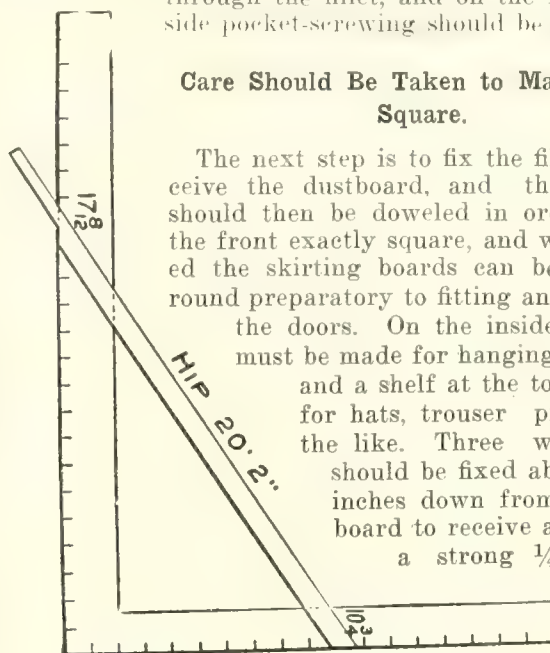


Fig. 3.

should be fitted to bushes attached to the fillets at the centre. Hooks are then placed over the bar to receive shoulders, sticks, and dresses.—John Bovington.\*

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### Simplest Way to Frame a Roof

Perhaps the most practical way of all to frame a roof, the simplest to understand, easiest to remember, and most rapid to apply, is simply to always take the rise and run, measure across the square, which gives the length. Rise and run give cuts, so you have it all. Fig. 1 illustrates a roof 25 feet wide and a rise 10 feet 9 inches, run 12 feet 6 inches. Measuring across the square from  $10\frac{3}{4}$  to  $12\frac{1}{2}$  gives  $16\frac{1}{2}$ , or 16 feet 6 inches is the length of the rafter.

Fig. 2 shows that if the run of common rafter is  $12\frac{1}{2}$  the run of the hip will be diagonal of  $12\frac{1}{2}$ , which is 17 and 8-12, as is plainly illustrated.

Fig. 3. As the rise is  $10\frac{3}{4}$  and run 17 and 8-12, the length will be 20 feet and 2 inches.

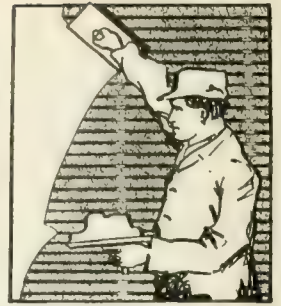
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The saving is so great when a planing mill man can do two or more jobs of work of the same kind at the same time, as compared to doing each separately, that every mill man should make considerable effort to group his orders. Keep a careful time and cost account of these things awhile and it will be easy to see and appreciate this point.





# Brick Work *and* Plastering



## Scientific Management in Bricklaying\*

We hear a great deal nowadays about scientific management, more particularly in regard to manufacturing methods.

What the manufacturer does the contractor must do if he expects to make a success of his business. He must carefully consider all existing methods, choosing those which are the most practical for him, regardless of his manner of doing work in the past, if he would increase the efficiency of himself and men and raise

of carrying brick in a hod and dumping them on the scaffolding for the bricklayers to pick up and use. In the same way mortar was carried in a hod and dumped down on the mortar board beside the masons. Following out this method of bricklaying, which has prevailed for centuries, it was found that the mason must turn around, stoop down to pick up a brick and handle it several times to find the best face for the outside of the wall. After he passed a brick from one hand to the other several times to examine the condition of its faces, he was obliged to stoop again to load his trowel with mortar. In bedding the brick, it was always the custom for a bricklayer to set each brick carefully on the strip of mortar and force it down by careful taps of the trowel, the end of the brick having been previously "battered" with mortar to form the end joint. Of course, all these motions are rapid and apparently efficient to the casual observer, but the efficiency engineers were not satisfied with casual observation. They scientifically tested ordinary methods of bricklaying, with the result that by introducing new ideas the motions necessary to lay brick have been reduced over 30 per cent.

### The Difference a Scaffold Made.

The first change that was made was in the construction of the scaffolding. Fig. 1 shows the form of effectual scaffolding arranged with a platform on both sides of the uprights. The brackets supporting the platforms slide up and down in the grooves of the upright, so that they may be raised as the wall goes up and the brackets pinned with steel pins. On one platform, set about knee-high to the wall, the bricklayers stand. Behind them, about waist-high, is the table which holds their brick and mortar. This table is kept supplied with material by helpers who mount the platform on the opposite side and dump their material on

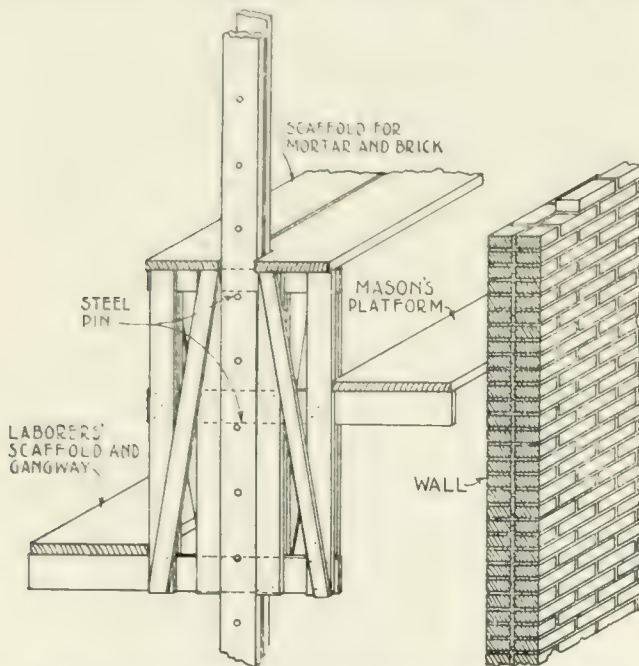


Fig. 1. Scientific scaffold which makes money for the contractor.

the percentage of his profit. Efficiency does not mean merely increased speed and consequently "taking it out of the men." On the contrary, efficiency means the elimination of all friction, the reduction of lost motion, and consequent increase of effectiveness. This applies to the work of the contractor himself, as well as the work of his men, for many contractors find that much of the tension and friction is in the work they do themselves. No work can be keyed up to a higher pitch than that of the master of the work himself, who is very apt to be taken as a model by those working under him.

In the rearrangement of the process of laying brick the motions of the brick mason have been reduced by one contractor from eighteen to four motions. Any one can readily see that this means the saving of effort on the part of the bricklayers, with an increase of profit to the contractor. Take, for instance, the old method

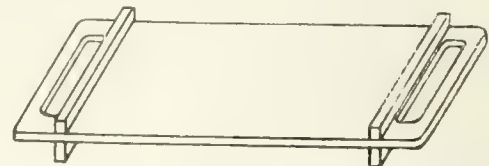


Fig. 2. -Pallet for carrying brick and hollow tile.

the table. The bricklayers are merely required to turn (without stooping), reach the bricks, and turning again (without stooping), place them in the wall.

### Pile Bricks With Best Faces Outward.

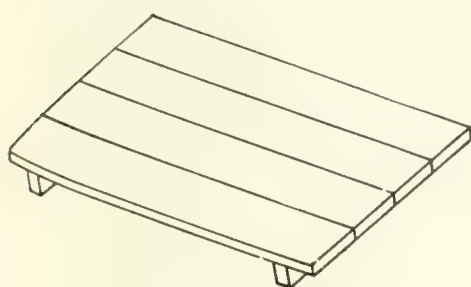
To save the lost motion of bricklayers caused by examining each brick to select its best face for the outside, helpers (at ordinary helpers' wages) select and stack bricks at the supply piles with the best faces toward the outside, just as they will subsequently lie in the wall. Each little pile of selected bricks is carried to the scaffolding on a wooden pallet and set down, pallet

\* Illustrations and article are by courtesy of National Fireproofing Co., Toronto.

and all, on the table, where the bricklayers can reach it and put each brick into the wall without examination. See Fig. 2.

### A Mortar Board That Saves Time.

Even so small a matter as the mortar board has been carefully studied, to see if improvements were possible, and Fig. 3 shows what is considered to be one of the best of the new designs for mortar trays. It has been found that the work of bricklayers is greatly facilitated by having helpers keep the mortar to just the right degree of stiffness, so that each brick can be bedded by a single push. Mortar too light allows brick to go far into its bed, and stiff mortar requires too much tapping. With mortar just right, one gentle



The old way. A mortar board.

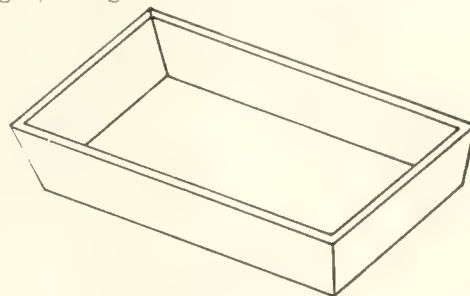


Fig. 3.

The new way. A mortar tray.

tap beds a brick at once, and no further manipulation is required. The helpers, therefore, are required to deliver at the mortar boards mortar of precisely the right consistency, and at each tip they stir up the material stacked on the board, adding more water if it is required. It was soon found that mortar trays built like the model shown in Fig. 3 are vastly superior to ordinary flat boards, and they have the added advantage in being stronger. The sides are beveled to facilitate the sweep of the bricklayer's trowel, usually held in the hand at a slight angle from the horizontal.

## How Mortar Affects the Crushing Strength of Bricks

Brick manufacturers have conducted tests which show that their products have crushing strengths ranging all the way from 2,800 to 4,000 pounds per square inch.

When the bricks are built up into masonry, however, the structure will not safely stand a load of more than 100 pounds per square inch, and only with the best building bricks is a load of 210 pounds per square inch considered safe. This is due to the fact that the mortar used in laying the bricks is, in itself, far weaker than the bricks, and it only gains strength as it hardens. Yet various investigations of ancient buildings show that lime mortar seldom, if ever hardens completely in the interior of the joints, so that the weakness of brickwork is not due to the bricks, but to the imperfectly hardened mortar.

This drawback can be overcome by using cement and sand in place of lime and sand for the mortar, and, provided that the joints are kept thin, and the correct proportions of cement are used, this cement mortar will not prove more expensive than ordinary mortar. On the other hand, the strength of the brickwork will be increased many times and a crushing strength of 3,800 pounds per square inch—corresponding to a safe load of 380 pounds per square inch—is not difficult to attain.—The Brickbuilder.

## Specifications and Methods of Applying Stucco

The following methods for making and applying stucco are given out by the Lehigh Portland Cement Company:

### First Coat.

1 bag of hydrated lime.  
2 bags of cement. Mixed dry until the color of mass is uniform.

### Second Coat.

1 bag hydrated lime, 40 lbs.  
4 bags cement.

### In Top Coat

The best mortar is composed of three parts sand to one part of the cement and lime mixture. The proportions of one to three to be used in each coat, which, of course, means the top will be one to three Portland cement mortar. Use just enough water to enable it to work easily.

The first coat should be well scratched, and second coat put on when the first coat is set enough to carry it.

The second coat should be scratched, and the third coat applied before the coat below is thoroughly set.

Each coat should be wet before the next coat is applied to prevent the rubbing off.

### Moisture Required for Setting.

The best way to insure a good surface is to hang burlap or canvas a few inches away from the plaster and keep this cloth wet for a week.

### Lath to Be Used.

Metal lath alone should be used, as it is free from temperature changes and the plaster is thoroughly reinforced, so the stucco becomes a reinforced concrete slab over the whole surface. Wooden lath should be green, or well soaked with water.

By using the above mixture, after securing practical plasterers to apply this stucco, there is no question why you should not get a first-class job.

## Primitive Methods Employed by East Anglians in Building Clay Houses

The following letter, taken from The Family Herald and Weekly Star, is interesting and shows how our ancestors made "bricks" and also how they laid them:

Noticing an inquiry re mud as a building material, I have thought that a short account of the way clay houses are built in the East Anglian districts of England might prove interesting, and perhaps useful. The clay used for the purpose is of a somewhat heavy, tenacious character and of a similar nature to that used for brickmaking. A possible drawback to the employment of the method in this country is the length of time needed for seasoning the materials, but this is to a great extent neutralized by the cheapness of the process, which costs nothing but the labor. When, however, a building is once erected, if well done, it is a lasting affair, for I know of many such over a century old. They are warm in winter and cool in summer. The main thing in putting them up is to protect the



walls by caves sufficiently wide to prevent raindrip from washing the material.

The clay is thrown in a level heap about 4 feet thick and left exposed to the air for 3 or 4 months, it is then turned over, mixing it all thoroughly, and lies for another month to temper. After this, it is spread on a hard, level surface, and short straw scattered over it; the whole is then well trodden by a horse ridden by a boy, water being added as required. This process is frequently done in the pit whence the clay was originally dug.

When thoroughly blended, the whole is cast into a heap ready to make up into clay-lumps as the cubes are called. For this purpose, a tool called a crome is used; it is like a flat-tined digging fork with a long handle, the tines being bent at right angles to the handle, like a dung-drag. With this the clay is pulled out and put into the mold. This is simply a box without top or bottom, measuring 18 inches long, 9 in. wide, and 4½ in. deep. An even hard space of ground is selected, the mold is placed on the ground, filled firmly, struck off with a straight-edge, and then removed about a foot further along. This is repeated until enough lumps are made; they are then left to become hard, after which they are set on edge to dry through. After being dried out, they are stacked in a dry shed for 12 months, being protected from frost by straw. When building, the same material is used for mortar, and after having dried out, the walls become one homogeneous mass. A brick or stone foundation is frequently employed. This is several inches wider than the lumps, a damp-proof course being laid to prevent the damp from rising. Blocks of wood are built into the inside walls to carry battens to which laths are nailed for plastering on in the usual way. Of course, matched lining could be used if preferred. Such buildings present a solid and comfortable appearance and whole farm premises are sometimes built of this material, but it is necessary to protect the inside of stables and piggeries with boards four feet high to prevent the animals from kicking and damaging the walls.

I imagine these clay-lumps are akin to the "bricks" made by the ancient Israelites under their Egyptian taskmasters, and also to the adobe of Mexico.

"SASKANIAN."

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## Remodeling Old Frame Houses

In the exterior plastering specifications recommended by the Associated Metal Lath Manufacturers, it is stated that during recent years there has come into vogue a method of remodeling old frame houses. This "over-coating," as it is called, is used extensively in all sections of the country and the following practice is recommended.

### Preparation of Original Surface

Every house has its own defects and characteristics and each must be treated according to its physical condition.

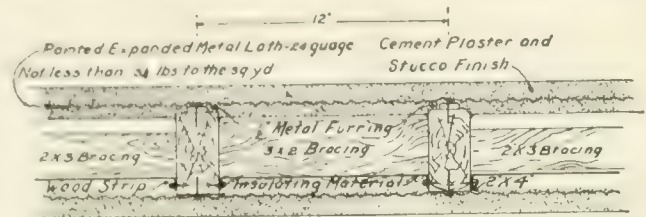
A tight roof is essential.

Where furring is used so deep that the space back of the lath is not entirely filled with plaster, some provision must be made for extending the old window and door frames to correspond with the increased thickness of the wall. In some cases the plaster is brought over the old frames in such a manner that a recessed window or door opening is made. In case the furrings are fastened to the studding, it is not necessary to provide for extending the window and

door frames, as the new stucco finish will have the same relations as the old weather-boarding.

If the weather-boarding is in poor condition it should be removed and furring and metal lath applied over the sheathing, to which waterproof paper has previously been fastened. It may be advisable also to tear off the sheathing, in which case the furring can be fastened direct to the studding after bracing between the studs and then finish as shown in type "A" herewith.

Another method would be to fasten the furring to the weather boards to which the metal lath is applied,



Detail Showing Section of Exterior Wall

after applying waterproof paper over the weather-boarding.

In preparation for any of these methods the house should be gone over carefully to determine if the frame work is well enough preserved to justify the improvement.

The doors should be looked after, the studding inspected, partitions and outside walls lined up and brought into plumb.

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## Builders' Acid to Remove Spots on Brick and Stone

Builders' acid, which is equal parts of muriatic acid and water, will remove spots of mortar on brick or stonework, but is not the right material for cleaning stone that is begrimed with smoke and dirt. To accomplish this, apply to the surface, with a long-handled fibre brush, a strong solution of caustic soda or pearl ash. Let it remain on for about fifteen minutes, then wash several times with clear water, using a stiff brush or broom for the purpose. If this will not be effective enough, scrub the stone with a stiff fibre brush, using soft soap and concentrated lye and sand, allowing this to remain on the stone until nearly dry, then rinse with clear water, using a brush to remove the cleansing material.

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## Brick and its Uses for Interior Decoration

Some years ago a well-known authority on decoration stated that, in America, "the return to a more substantial way of building would undoubtedly lead in time to the use of brick, stone, or marble floors." Today, in what is practically a renaissance of brickwork, we have not only the brick floors, but the interior brick wall. While the interior of a residence or business building may be designed with an eye to its general effect upon the public at large, it is naturally the decoration of the interior which is most closely associated with its occupants. For this reason, especially in the case of the private house, while the building itself may pass from owner to owner in the course of time without any exterior change, yet its interior decorations are often subject to many vicissitudes owing possibly on the one hand to such causes as fading wall paper, or



the soiling of stucco, and on the other to the fact that both these materials being easily removable, a free hand is given to the exercise of individual taste, which is too often out of all harmony and spirit, not only with the general architectural feeling, but with the surroundings.

Among the several materials used in the decoration of the interior, marble, stone, wood, tile, stucco and wall paper each and all will ever continue to fill the decorative schemes of certain rooms; but there is another material which, considering its fireproof and sanitary attributes together with practicability of cost, would seem to merit consideration with other materials for certain interiors, the character of which it may be of interest to discuss.

### Some of the Advantages of Brick

"Brick" in the private house is being used in hall, library, billiard room and pergola, and in such parts of larger buildings as the church, theatre, loggia, hotel vestibule and rathskeller. While libraries, railroad waiting rooms, and many other public buildings are, under the skilful hands of our modern architects, being constructed of brick in forms and color schemes which a short time ago would have been almost undreamed of.

An important point in favor of the selection of brick as a decorative medium for interiors is its imperishable qualities, and, while there are many rooms in which brick would be totally out of place, at the same time there are certain rooms, such as the den, billiard room and library, which might well be carried out in good brickwork laid up in decorative effect.

In such rooms, the necessity of repapering or renovating would be obviated, as would otherwise be the case with, say, ordinary wall paper, in which new designs are constantly being produced and older patterns withdrawn; so that, even after one has expended time and thought in the selection of an appropriate pattern and shade, the continuity of a particular decorative scheme in your room is dependent entirely upon the life of the paper itself, and, being unable to duplicate it, one is forced once more to search for a suitable background for pictures, hangings and furniture.

### Brick Can Compete from an Artistic Point of View

The mind of the average householder may at first recoil from the idea of a brick interior as presenting a cold and unfinished appearance. The partial reason for this may be the fact that they have always associated brick with the exterior of the building only, and, indeed, the general idea of brickwork itself is something in the nature of an uninteresting brick surface, red, gray or yellow hue, the term "masonry" perhaps better illustrating their conception of the effect, rather than "finished brickwork." Under the circumstances, the view taken is a very natural one, for an interior constructed of mere masonry would have an unfinished, cheerless and undoubtedly unsightly appearance. The crux of the situation lies in the fact that brickwork of to-day has reached a point of artistic possibility where it competes successfully with any of the other building materials and, just as one cannot attempt to compare the appearance of a wall hung with cheap monotone hangings with one draped with rare Eastern fabrics, so, too, there is absolutely no comparison between an ordinary brick wall and a finished interior constructed of some of the high-class decorative brick products of to-day.

Brick, as a building material, is one of the oldest in

the world, and its comparatively recent adoption in connection with interior decoration is due to the wonderful colors and textures of the modern artistic face brick. The varying shapes and shades of the modern rough-textured brick have resulted in the introduction of ornamentation into brickwork of the same texture and finish as the field itself, thus obviating the introduction of glazed tile and marble as an adjunct to the brickwork.

The cost of brick decoration compares favorably with either marble or decorative plaster. For example, brick decorative panels, according to some recent estimates, average about \$1.50 per square foot, including designs, and \$1.50 per square foot for installation, while the cost for less pretentious decoration seems in the neighborhood of 75 cents per square foot for material and the same amount per square foot for installation.—Geo. J. Jervis in the American Architect.



### Machine for Sawing Stone Walls

The modern builder thoroughly appreciates the importance of waterproofing foundation walls to prevent dampness from creeping into them and injuring them. Accordingly, it is the custom to protect the foundation walls with a good coating of asphalt or the like. However, there are many buildings, particularly in the older countries, in which no such provision against the entrance of dampness and frost was made. In order to preserve these buildings, a method of insulating them against dampness has been devised by a German engineer. It consists in sawing a slot in the foundation wall just above the ground line and introducing in the slot asphalt-coated lead plates. A special machine has been designed to saw the masonry, producing a kerf about one inch wide. As the work is done progressively, the plates being introduced as the sawing proceeds, the stability of the building is not endangered. However, to prevent any possible accident, conical iron cramps are introduced in the saw kerf. After the introduction of the insulating plates, the slots are closed with temporary wooden forms, and then they are grouted with liquid cement, which completely fills them and any gaps still left open. The cement adds to the insulation, and the wall is thus thoroughly protected against creeping of moisture from the ground upward. To dry out the walls over the insulating plates, a special stove is provided.—Scientific American.



Hamilton city council has approved the recommendation of the building inspector for the services of an assistant.

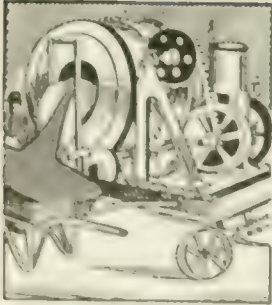


Good luck may help a few of the fellows along in the world, but hard work is the best thing to pin your faith to.

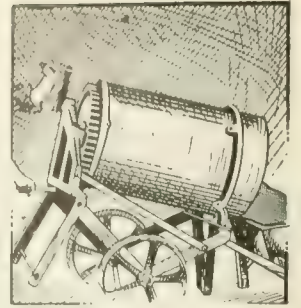


The building returns at Montreal show that from January 1 to May 31, 1914, the total value of building permits issued was \$6,578,314, representing 1,823 buildings, as against 1,577 buildings and a total value of \$7,663,861 in the corresponding period last year. Both the number of permits issued and the value of building done during May of this year exceeds that for the corresponding month last year, the figures for 1914 being 716 permits, valued at \$2,517,148, compared with 655 permits and a total value of \$2,473,608 in May, 1913.





# Concrete Department



## Care Needed in Selecting Lumber for Concrete Forms

The selection of lumber for the making of concrete forms is of importance. If the forms are to be used several times, surfaced lumber, matched, tongued, and grooved stuff, free from loose knots, is an economy. If, however, they are to be used only once, almost any old kind of plank will do. By nailing a board on the outside of the cracks or over the bad knot, and filling with a little clay, the form is made tight.

Green lumber is preferable to kiln-dried or seasoned stuff. Seasoned stuff, when wet (either by throwing water on the form before placing the concrete or by absorbing the water from the concrete) warps, and the shape and tightness of the form are damaged.

Originally, only surface lumber was used for forms, dependence being placed on it for giving finish to the work. While to-day other than smooth surfaces are the fashion for concrete, surfaced lumber has some advantages. The forms fit together better and are more easily erected. They are cleaned easier. They are easier to move, and all these items reduce the cost of work. The saving effected will, of course, depend on the difference in the local price between finished and rough lumber.

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## Sand for Concrete

Little thought has been given to the comparative value of sand as affecting the quality of the work, also the convenience and economy of construction.

### Sands' Strength Differ.

A given sand may possess twice the strength of another sand from the same locality in the proportions of mortar or concrete commonly followed. Some sands in proportions of three parts of sand to one part cement will develop equal or greater strength than other sands in the proportions of two parts of sand and one part cement, or where the difference is not quite so marked the better sand will develop a strength in three days equal or superior to the inferior sand at seven days.

If the concrete does not harden promptly and it is necessary to push the work, it means that additional lumber must be purchased. The real value of sand as a mortar ingredient, or for concrete, can be determined only by tests. Unfortunately, the cost or inconvenience of having sand tested in the laboratory forbids this investigation in a great majority of cases. This may be performed somewhat in the following manner:

### Test for Contractor.

Take one quart of Portland cement, well shaken down, and three quarts of sand, and mix the sand and cement thoroughly dry, then temper with clean water to the consistency used in the work. Put this wet

mixture in a form, tamp or shake down, and allow to stand in a protected place without being disturbed, and examine at the end of one day, two days, or three days. If the sand is of good quality, the mortar should be hard and possessed of considerable strength at the end of one day; at the end of forty-eight hours remove from the form and test by striking with a hammer for strength and hardness. If several sands are tested in the same manner, it will be easy to distinguish the best.

Concrete in sidewalks or steps, where the area exposed is large compared with the bulk of the work, the concrete should be protected from the direct rays of the sun. It would improve work of this character if sprinkled frequently following completion of the work. —Keith's Magazine.

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## Efficient Concrete Distribution

The accompanying illustration shows the method of handling concrete used by the F. W. Mark Construction Co. in the erection of a large reinforced concrete building for the Ford Motor Car Co., Toronto. By this method one mixer, centrally located, supplies con-



Concrete is carried from the mixer to any part of the buildings by the sheet iron trough. The trough is moved into any position by the derrick.

crete to all parts of the building with a minimum amount of labor.

The crushed stone and sand is brought in carload

lots and unloaded at a short distance from the mixer, which is set up at the foot of the derrick. The concrete is run from the mixer directly into a bucket hoist, which carries it up and dumps it into the hopper. From the hopper it is carried by means of the sheet iron trough to any part of the building where it is needed.

The trough is made in sections, so that it may be built up to any desired length, and is moved from place to place by means of the derrick. The derrick and the hoist for carrying the concrete up to the hopper are operated by a hoisting engine, which is not shown in the illustration.



## Important Points to Remember in Concrete Working

The materials must be perfectly clean.

The mixing must be in proportions carefully determined.

The mixture must be used while absolutely fresh.

Good results cannot be obtained unless you use a good cement, nor will the work be at its best unless care is taken in the selection of clean sand and clean stone.

Among those who are new at concrete work, there is an all too prevalent idea that anything is good enough for making concrete. Some will tell you that sawdust, shavings, mud, clay, etc., will do to complete the mixture, but the absurdity of this notion will soon become evident to anyone who neglects these few precautions.



## Making Cement Watertight

Extensive experiments are being conducted at the College of Engineering of the University of Wisconsin to find a simple means of making concrete watertight. Results of great importance to contractors, engineers, and farmers who have to do with concrete construction are said to have been obtained already, and still more important ones are expected.

Already some interesting results have been obtained in the effect of the length of the time of mixing in a machine mixer of the batch type; the effect of the percentage of mixing upon the imperviousness of the concrete; the effect of having sand in dry condition before mixing, and the effect of having the sand wet.

### Results When Dry Materials Are Used.

The experimenters have found that good results are obtained if the concrete remains in the mixer from two to three minutes when dry materials are employed. For cases where the sand and gravel or stone are damp a considerably longer time is required. Therefore, the use of wet sand should be avoided if possible. The experiments showed that mixtures consisting of one part cement, one and one-half of Janesville sand of the torpedo grade, and three parts of Janesville gravel, when mixed to a wet consistency, are impervious to water when subjected to a pressure of 40 lbs. to the square inch. Mixtures as lean as one part of cement to six parts of gravel (a graded mixture) have been made impervious at high pressure by using care in proportioning the amount of water and in mixing the batch. The specimens used in making these tests are cylindrical in form and so made that the faces of the cylinders, which are 13½ ins. in diameter, are exposed to the predetermined water pressure. The thickness of the concrete through which the water must pass can be varied from 4 to 18 inches. Ample provision is made for cleaning both faces of the cylinder before

placing it upon the testing apparatus. The apparatus itself is so arranged that very accurate tests can be made.

The importance of these experiments will be more sufficiently appreciated when it is understood that a large proportion of the trouble arising from poor concrete is due to the use of defective sand or gravel.

The department is also studying the effect of varying the percentages of cement and water, the graduation of the sand and gravel (by this is meant the size of the rocks and the fineness of the sand), the proportioning of the mixture, the thoroughness of mixing, and the effects of different conditions on the hardening of the specimens.



## Smooth Surface on Concrete

A concrete floor that is laid wet, and containing a great deal of water, which will have a chance to pass downward before the cement has set, will have the cement nearly all pulled down from the surface by the water, leaving the surface pretty much like the surface of a piece of sandpaper. A concrete floor that is laid under conditions that allow the cement to set well without any perceptible amount of water passing down through the concrete, will have a fairly smooth cement surface if trowelled before it has set. The floor that has been left with a rough, sandy surface by the action of water, in pulling the cement and smaller particles of sand downward from the surface, may be given a hard, smooth surface by coating it with pure cement mixed very thin with water, so that it may be spread over like a coat of paint. It takes very little cement to put on a coat this way. In case it is put on so soon that it settles partly into the body of the concrete, leaving a slightly rough surface, a second coat, after the first coat has set well, will give a very hard, smooth surface.



## Engine Base Constructed of Concrete

The concrete worker who desires to drum up a little trade with the farmers of his district should suggest that engine bases be constructed to accommodate the gasoline engine, cream separator, and other pieces of machinery used on the farm. All these machines require solid bases, and a pedestal of concrete will add years of service to the life of a cream separator or a gasoline engine.

To form the base for the support of a small engine, first excavate a pit 2 ft. 4 in. deep and 1 ft. larger in length and width than the dimensions of the engine-base. Fill the pit with a mixture of concrete (1:2½:5), and then construct a form which will carry the concrete to a height 4 in. above the floor level or to the height desired.

Bolts should be set in the concrete before it dries, these being sufficiently long to bend 4 in. at right angles and to extend 1 ft. deep into the concrete, with bent end down. They should be placed with the upright part surrounded by gas pipe of twice the diameter of the bolt and of a length sufficient to come flush with the surface of the concrete. The open space formed around the bolt by the pipe will allow for slight errors in locating bolts, so as to meet the holes in the engine base.

Keep the concrete wet for 24 hours after placing by sprinkling. After six days set the engine, adjust the bolts, and fill the spaces around the bolts with cement mortar, mixed 1 part cement and 1 part sand. Do not use the engine until the concrete base is at least two weeks old.



## Concrete Chimney Caps

Concrete caps are cast in one piece, on the ground, and in any shape desired. The outside form is a wooden box, with inside dimensions corresponding with the outside dimensions of the desired cap. Usually the cap is 6 in. thick and has an "over hang," or "drip," extending on all sides beyond the outside of the chimney. Thus at top of chimney, over all, is 18 in. square, make outer form 22 in. square, an extra allowance of 2 in. on all sides, thus obtaining a cap that will have an "over-hang" of 2 in. all the way round.

The inside form may consist of a piece of terra cotta tile. If more than one opening is desired in the cap, use two pieces of tile or as many as there are to be openings.

Mix concrete 1:2:4, the mixture to be a thoroughly wet one. Place in the form, after greasing outside of terra cotta, so that same may be easily removed. Leave undisturbed for two days. Remove forms and place cap in position, attaching it to the brick chimney with a cement mortar, 1 part cement to 1 part sand.

\* \* \*

## Liquid Cement to Strengthen Foundations

The grouting experiments which have been in progress at the old post-office site, London, England, with a view to determining the possibility of strengthening the foundations of St. Paul's Cathedral by injecting liquid cement into the subsoil, have been successful. A number of borings have been made, and the liquid cement has been injected into them by compressed air. The cement has permeated the subsoil for a considerable distance around each of the borings; and not only gravel and sand, but also clay, has been transformed into a solid concrete mass. It is probable that the process will now be applied to the subsoil under St. Paul's Cathedral.

\* \* \*

## Care of Paint Brushes

Brushes for applying oil paints must be well cleaned after using, though for keeping overnight it is generally sufficient to wrap them in several thicknesses of paper. Some painters keep their brushes overnight by putting them in water. If, however, the brush is not to be used for several days, the paint should be washed out of it. Turpentine is one of the most satisfactory materials for washing a brush, but it is expensive, and a brush can generally be washed as well with kerosine, which is much cheaper. After washing off the paint with kerosine, the brush should be rinsed with gasoline or benzine, then thoroughly shaken and well washed with soap and warm water. As soon as this washing is complete, the brush should be shaken thoroughly so as to throw as much water out of it as possible and hung up with the bristles down to dry; when dried, the brush should be thoroughly protected from dust. If much painting is being done, it is less trouble to keep the brushes in turpentine or kerosine. For this purpose hooks should be fastened on the inside of a pail with a close-fitting cover, the brushes being suspended either by holes in the handles or by loops of string, so that the brushes hang in the kerosine or turpentine in the bottom of the pail. The bristles should be submerged in the liquid, but should not touch the bottom of the pail. If kerosine is used for cleaning, it should be removed by shaking the brush and rinsing

it in turpentine before using again with paint. Brushes used with whitewash or calcimine should simply be washed and not put in the same liquids in which the brushes used for oil paints are kept. If a brush has been used for shellac varnish, it should be kept in alcohol or in the varnish itself. In general, a varnish brush may be kept in the varnish in which it is used.

\* \* \*

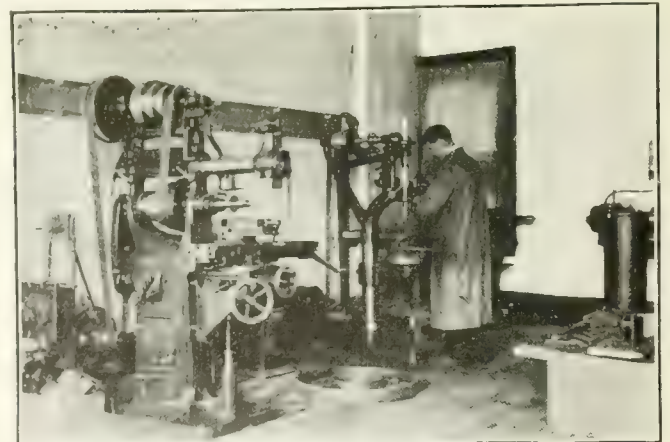
## Machine Shop Devoted Exclusively to Manufacture of Patent Models

The accompanying illustration shows a view in the machine shop operated by the Patent Selling and Manufacturing Agents, Toronto, for the benefit of their clients in the preparation and manufacture of patent models. The shop is equipped with milling machine, drill, power saw, grinder, and lathe, each of which has individual motor drive, so that small work may be done at a minimum cost.

The inventor who has an idea which he wishes to patent may, by the payment of a nominal rental, have the use of the up-to-date machinery with which the shop is equipped and the advice of competent engineers and mechanics for working up his idea and making his model.

If the inventor does not wish to make his model himself, he can send his rough idea in to the designing department, where his working drawings are prepared, and after being approved by him are sent to the shop. In the shop the model is made under his supervision, and he is able to make any modification or improvements which occur to him during its construction.

One great advantage of having a working model before applying for the patent is that the changes which



Machine Shop of Patent Selling & Mfg. Agency, Toronto, showing some of the machinery at the disposal of clients who wish to make their patent models.

are made while the model is being made may render a patent obtained from the working drawings useless and make it necessary to obtain a new patent.

\* \* \* \*

What will be the longest arch in reinforced concrete is now being built at Langweiz, Switzerland, on the Chur-Arosa Railway. The arch will have 160 feet rise and a clear length between abutments of 330 feet. This will be the largest structure of its kind in existence, being about two feet longer and 130 feet higher than the Risorgimento Arch over the Tiber at Rome, Italy.

## Proportions of a Warm Air Heating System

THE successful operation of a warm air furnace heating system depends entirely upon it being properly installed. The amount of warm air required to heat any given room depends entirely upon the amount of heat lost from the room, and the temperature of the air entering.

A furnace that is properly proportioned will deliver air at a temperature of about 140 degrees Fahrenheit, and since it is desirable to maintain a temperature of 70 degrees, there will be a drop of 70 degrees in the temperature of the air in cooling to the temperature of the room. Each cubic foot of air in cooling 70 degrees delivers 1.1 British Thermal Units.

### Loss of Heat and How to Offset It

Each square foot of glass surface will transmit 85 B.T.U. per hour. Then the number of cubic feet of air required to offset this loss is 85 divided by 1.1 equals 77 cubic feet. At a velocity of 280 feet per minute, which is readily attained, each square inch of pipe area will deliver 117 cubic feet of air per hour. Then each square foot of glass will require a pipe area of 77 divided by 117, or 2-3 square inches.

Each square foot of exposed wooden wall surface (less the glass) will transmit 19 B.T.U. per hour, and in the same manner we find that a pipe area of 1-7 square inch is required to offset this loss. There will be a leakage of air from each room per hour about equal to its cubic contents. This air escapes at a temperature of 70 degrees and each cubic foot carries off  $1\frac{1}{4}$  B.T.U. The amount of pipe area required to offset this loss is about 1-100 square inch.

Then, to find the total pipe area necessary to heat any given room we have this formula: 2-3 glass surface plus 1-7 exposed wall surface plus 1-100 cubic contents. An 8-inch brick wall will transmit 31 B.T.U. per square foot per hour, and the formula derived for a building of this kind is 2-3 glass surface plus 1-4 exposed wall surface plus 1-100 cubic contents.

A 12-inch brick wall will transmit 23 B.T.U. per square foot per hour, and the formula derived for such buildings is 2-3 glass surface plus 1-6 exposed wall surface plus 1-100 cubic contents.

A 16-inch wall will transmit 19 B.T.U. per square foot per hour, the same as an ordinary wooden wall, and the formula is the same, 2-3 glass surface plus 1-7 exposed wall surface plus 1-100 cubic contents.

On account of the increased velocity of the wall pipes the pipe area required for second and third floor rooms is 7-10 and 3-5 respectively. If a hall extends to upper floors, count all space and exposures with the first floor.

When the result obtained is not equal to the area of a standard size and the pipe is not over six feet long, use the next size smaller, otherwise use the next size larger. Never use a pipe smaller than eight inches in diameter.

In the above calculations, it is assumed that each pipe has an elevation of one inch to the running foot.

### Chimney and Smoke Pipe

The construction of a chimney is a matter of great importance. All brick chimneys should be made as smooth as possible on the inside, by plastering or by the use of tile linings. Abrupt turns or contractions in its area must be carefully avoided. A chimney that is less than eight inches in depth is not good. None less than

8 x 12 should be used, and there should be no other openings than that for the furnace. To avoid down draughts, it must be carried above the highest point of the roof or be provided with a suitable top or hood.

The smoke pipe should be as short and straight as possible. It is also advisable to have as much elevation as can be given to it, but not coming nearer than 18 inches to the joist. The pipe should be connected as nearly air-tight as possible to both furnace and chimney.

If the space to be heated is in one room, such as stores, halls, churches, etc., the warm air register should be placed directly over the furnace if possible, and the area required to supply the heat will be 4-5 of the amount as computed by the foregoing formulas, owing to the greater velocity obtained by reducing the friction. A register without valves must be used.

The furnace should be located so as to equalize the length of all warm air pipes, favoring the rooms mostly exposed.

As high a hood as possible should be used, in order to have a large air chamber over the furnace. This chamber will always hold a large supply of warm air, which naturally will tend to rise, thus creating a plenum or pressure, which will insure a proper proportion of air to each pipe.

### Warm Air Pipes

The collar for the warm air pipes, if attached to the side of the hood, must be placed as close to the top as possible, and the upper sides be on a level. Never connect a pipe over the front of a furnace if possible to avoid it. Each pipe should be provided with a damper, located near the furnace, and must run as direct to the register as possible. If a turn must be made, avoid all sharp angles. Each pipe must have an elevation of at least one inch to the running foot, and be covered with asbestos felt.

Great care should be exercised to see that all openings in basement or foundation walls are properly

CAPACITY OF PIPES AND REGISTERS

Size of Pipe Inches	Area Square Inches	Size of Register Inches	Size of Pipe Inches	Area Square Inches	Size of Register Inches
8	50	8x12	22	380	24x24
9	63	9x12	24	452	27x27
10	78	10x12	26	551	30x30
12	113	12x14	28	616	28x36
14	154	14x18	30	707	30x36
16	201	16x20	32	804	36x36
18	254	18x24	34	908	36x40
20	314	20x24	36	1018	36x48

closed during the cold season, as a current of cold air against any hot air pipes acts as a damper to the proper flow of air through them.

All warm air registers should be placed in a warm part of the room and as close to the furnace as possible. The natural trend of air currents within a room is downward over the cooling surfaces of outside walls and windows, and if a warm air opening were to be placed in that part of a room, the currents would be in a collision and prevent the warm air having free access to the room. If the registers are located as directed, the warm air entering will move in concordance with the currents within the room, and an even temperature will be maintained.

The use of double pipes is advocated, as the flow of



air through them is better than if single pipes are used. The reason for this is, that with the patented double pipes, the inside pipe has a straight smooth surface; it does not buckle nor warp, thereby reducing its size, but always retains an even and unobstructed passage from the boot at the bottom to the register head or top. The outside pipe prevents the inner one from becoming chilled, and also prevents any danger of setting fire to the woodwork by becoming overheated.

These pipes must never be placed in an outside wall.

#### Cold Air Problem

Cold air is a most important feature to the successful operation of a warm-air heating system. Ninety per cent. of the trouble encountered in faulty furnace installation is caused from not having a sufficient air supply. The cross sectional area of the cold air duct should be equal to the combined area of the warm air pipes. In no event must it be less than 90 per cent.

#### TABLE OF HOT WATER MAINS AND BRANCHES

1 in. pipe will supply two  $\frac{3}{4}$ -in. pipes.  
 $1\frac{1}{4}$ -in. pipe will supply two 1-in. pipes.  
 $1\frac{1}{2}$ -in. pipe will supply two  $1\frac{1}{4}$ -in. pipes.  
 2-in. pipe will supply two  $1\frac{1}{2}$ -in. pipes.  
 $2\frac{1}{2}$ -in. pipe will supply two  $1\frac{1}{2}$ -in. and one  $1\frac{1}{4}$ -in., or one 2-in. and one  $1\frac{1}{4}$ -in. pipes.  
 3-in. pipe will supply one  $2\frac{1}{2}$ -in. and one 2-in., or two 2-in. and one  $1\frac{1}{2}$ -in. pipes.  
 $3\frac{1}{2}$ -in. pipe will supply two  $2\frac{1}{2}$ -in., or one 3-in. and one 2-in., or three 2-in. pipes.

No dampers or valves should be placed in the duct that would in the least obstruct the flow of air to the furnace.

It is just as important to have this duct short and straight as the warm air pipes, and it should pitch down, and be connected to the casing with a shoe not

over 20 inches high. In this manner, the friction is reduced to a minimum. Pits or underground ducts are not recommended because of the great friction bound to be produced.

The cold air register should be placed in a hall of some room having a circulation to it from all parts of the house. Sometimes it is better to have two separate air ducts. It is not as important to have these registers in the cold part of the room as it is to have it close to the furnace, and in such a position as to form a complete circulation throughout the building. They are often placed side by side, the cold air on the same side of the room as the hot air register. This is advised, especially in churches, as it obtains perfect results and often greatly reduces the expense of installation.

#### Furnaces Set in Battery

Sometimes it is desirable to set two or more furnaces side by side in battery form. This mode of installation has several advantages in heating large buildings. Portable furnaces are cased up separately to the top casing ring and one hood placed over all. Brick-set furnaces set in battery are bricked up together and a sheet metal partition placed between them. Placing the furnaces in this manner, they are more convenient to care for than if set in separate parts of the basement. In mild weather only one furnace need be used to heat the entire building. The air supply is equally divided between them and in portable settings, separate connections made to each. Separate smoke pipes may be run to the chimney or they may be teed into each other.

In the latter event, each connection should have a tight damper fitted into it before entering the main pipe, so that it may be shut off when the furnace is not in use; otherwise, the air drawn through the unused



Stone and stucco residence  
of C. E. Lailey, at  
26 Whitney Ave., Toronto.

furnace would act as a check on the other. A check damper should be placed in the main smoke pipe.

All of the formulas that have been given are for rotating the air in the building. By using this method, the best results will be obtained at a minimum cost of fuel. The best authorities claim it is the most healthful, since when, using outside air, dust, dirt and germs are brought into the building through the air duct.

In an ordinary building, enough air will leak in and out to maintain the necessary state of purity.

If outside air is used, it is absolutely necessary to provide a ventilating system in order to secure good results. Two things cannot occupy the same place, at the same time, and if air is brought into the building, the same amount must be exhausted from it. Every cubic foot of air used for ventilating will carry off  $1\frac{1}{4}$  B.T.U., which must be added to the formulas given.

#### Table of Temperature for Furnace Tests

The following table, computed by Prof. R. C. Carpenter, will be valuable to heating contractors who desire to test a warm-air heating system, especially during the summer months.

If the outside temperature is as below, it is necessary to maintain an inside temperature, as shown below, to equal a temperature of 70 degrees in zero weather.

10 degrees below zero, outside, the temperature should be 64 degrees inside.

Zero, outside, the temperature should be 70 degrees inside.

10 degrees above zero, outside, the temperature should be 75 degrees inside.

20 degrees above zero, outside, the temperature should be 81 degrees inside.

30 degrees above zero, outside, the temperature should be 86 degrees inside.

40 degrees above zero, outside, the temperature should be 90 degrees inside.

50 degrees above zero, outside, the temperature should be 98 degrees inside.

60 degrees above zero, outside, the temperature should be 104

degrees inside.

70 degrees above zero, outside, the temperature should be 110 degrees inside.

80 degrees above zero, outside, the temperature should be 117 degrees inside.

90 degrees above zero, outside, the temperature should be 123 degrees inside.

## News of Builders' Exchanges

### Annual Picnic of Toronto Builders' Exchange\*

The annual picnic of the Toronto Exchange will be held to Queenston Heights on July 16. Advertising this fact, the daily bulletin of the exchange says:

"Summer is again with us, and our thoughts are running to the WOODS. It is, therefore, decreed that on July 16th next we shall again lock that WICKETT and take a CRUISE to Queenston Heights for another grand PICNIC under the same old SKIPPER. Last year we had a BULLEY crowd, but this year we want it to be a CHAMPION one. As Cupid seems to play a NOBLE part at these functions, we have arranged for lots of LOVE to be present. The same arrangements have been made as to tea, etc., so all can come prepared to PECK-OVER everything, even to the BERRY, and there need not be an AIKEN-HEAD. As there were a few accidents to clothing during the ball game, we have arranged for a TAYLOR to accompany us, and for those who get spots knocked off a PAINTER will be in attendance. There will also be a GARDINER to prepare the race course, and therefore no spider's WEBB will be seen. It may not be generally known,

\*NOTE—The words in capital letters are names of different members of the exchange.

One of the beautiful homes in Rosedale, Toronto.  
D. B. Hanna's residence.





but there is a BEAVER always on show at our picnics, and GANDERS may be seen on the small lake in the grounds.

"We hope that all members will mark the PAGE in their diary that holds this date, as we are sure that they will return to town feeling much WELLER than they left it."

\* \* \*

## Halifax Exchange Elects Officers

The first general meeting of the reorganized Halifax Builders' Exchange was held recently and the new constitution and by-laws were adopted.

The election of officers resulted in the following being elected: Honorary president, S. M. Brookfield; president, A. D. Falconer; vice-president, James Farquhar; directors, H. Roper, Brookfield, Limited, W. D. Purvis (Rhodes, Cury, Limited), J. P. Longard (Longard Bros.), J. O. Harris (Harris and Sons), P. Martin (Martin and Moore); Mr. McInnes (McInnes and Sons); Mr. Marshall (Marshall Bros.); E. J. Horne (Horne and Sons); S. Freeman (Freeman Bros.); Mr. Donohue.

\* \* \*

## Secretary of Prince Albert Exchange Resigns

John R. Davidson, for the past two years secretary of the Prince Albert (Sask.) Builders' Exchange, has resigned, to accept, it is understood, a position with the Dominion Government. There are two applications for the position—one from H. L. Fitzsimmons, late building inspector of the city of Prince Albert, and the other from H. M. Morrison, water works clerk.

At a recent meeting of the exchange, a committee was appointed, including some of the most prominent business men of the city, to look into the matter of amending the city building by-laws, which were printed in 1912. These by-laws are very strict with reference to buildings which are to be erected in the first and second-class fire limits, and it is alleged that the area covered by this space is too large, and many buildings would be erected within these areas were it not for these restrictions. The committee which was appointed have been going through the by-laws clause by clause, and its recommendations will be considered by the city council at an early date. The committee met at the request of the Prince Albert board of trade, and they are acting jointly in the matter.

\* \* \*

## Officers of Canadian National Association of Builders' Exchanges

### WESTERN DISTRICT

President—C. R. Frost, Edmonton, Alta.  
1st Vice-President—J. P. O'Leary, Saskatoon, Sask.  
2nd Vice-President—Jas. Bourgeois, Winnipeg, Man.  
Secretary-Treasurer—A. M. Frith, Edmonton, Alta.

City	Secretary and Address
Brandon, Man.	E. P. Fuller, Suite 1, Northern Crown Bank.
Dauphin, Man.	E. N. Hyland, General P.O.
Winnipeg, Man.	A. M. Rose, Builders' Exchange Bldg.
Moose Jaw, Sask.	A. Guest, 16 Ferguson Block.
Prince Albert, Sask.	Jno. R. Davidson, General P.O.
Regina, Sask.	Geo. Powell, 206 Kerr Block.
Saskatoon, Sask.	Maurice R. Prout, Oddfellows' Temple, 21st Street East.
Swift Current, Sask.	Jno. McIntosh, Box 268.



Ornamental plastering in the "American" dining room of the King Edward Hotel, Toronto done by Hoidge & Sons Toronto.

Saskatchewan Asso. of Builders' Exchanges--W. Powell, Regina.

Calgary, Alta.—F. C. Rankine, General P.O.

Edmonton, Alta.—Frank Drayton, McDougall Court.

Lethbridge, Alta.—Wm. Walker, 405 Sherlock Bldg.

Medicine Hat, Alta.—Chas. E. Dyce, General P.O.

Vancouver, B.C.—W. Hamilton-Lindsay, Box 45.

Victoria.—D. B. Plunkett, 503 Union Bank Bldg.

#### EASTERN DISTRICT

President—Geo. Gander, Toronto.

1st Vice-President—L. H. Martyn, London.

2nd Vice-President—Jas. Ballantyne, Montreal.

Secretary-Treasurer—P. L. Fraser, Toronto.

Brantford.—A. J. Cromar, 103½ Dalhousie St., P.O. Box 212.  
58 Granville Street.

Chatham.—S. G. Kinsey, 14 Fifth St.

Guelph.—Mahoney Bros., General P.O.

Hamilton.—G. T. Davidson, 325 Chancery Chambers, Main Street East.

Kingston.—E. R. Beckwith, C.E., 292 Earl Street.

London, Ont.—Fred. S. Barclay, Builders' Exchange.

Ottawa.—J. S. G. Adamson, 126 Sparks Street.

Sault Ste. Marie.—MacPhail & Wright Cons. Co., P.O. Box 835.

Stratford.—J. L. Young, Box 212.

St. Catharines.—Thomas Mesler, General P.O.

St. Thomas.—E. O. Penwarden, 1 White St.

Toronto.—A. E. Flower, 2 Berti Street.

Windsor.—A. E. Paddon, 163 Louis Ave.

Montreal.—R. L. Werry, 263 St. James Street.

Quebec.—A. Cote, 23 Rue St. Jean.

Halifax, N.S.—H. Roper, care of S. M. Brookfield, Limited.

St. John, N.B.—Charles F. Stevens, Builders' Exchange.



## Edmonton Exchange Notes

The Edmonton Builders' Exchange has completed arrangements to hold the annual picnic on July 11 to Wabamum Lake. A special train has been chartered and meals will be served. The committee is arranging for an extensive program of sports, and good prizes will be given.

The present membership of the Exchange is 164, and a provincial charter for incorporation has been applied for.

A bulletin is now being issued by the executive, and copies are mailed to all members. Syd. O'Keefe, 334 Alberta Ave., is in charge.



The building department at Montreal has been reorganized and a number of new appointments made. The salary of Mr. Alcide Chausse, building inspector, has been raised from \$2,500 to \$4,000.



Although permits have not been taken out as yet, it is stated on good authority that building to the value of \$1,500,000 will be started in Medicine Hat, Alta., in the very near future.

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There is nothing more dignified or elegant than our large Weatherproof Fiber Cardboard Signs. More serviceable than iron, wood or cloth. Packed in a box—printed—ready for displaying.

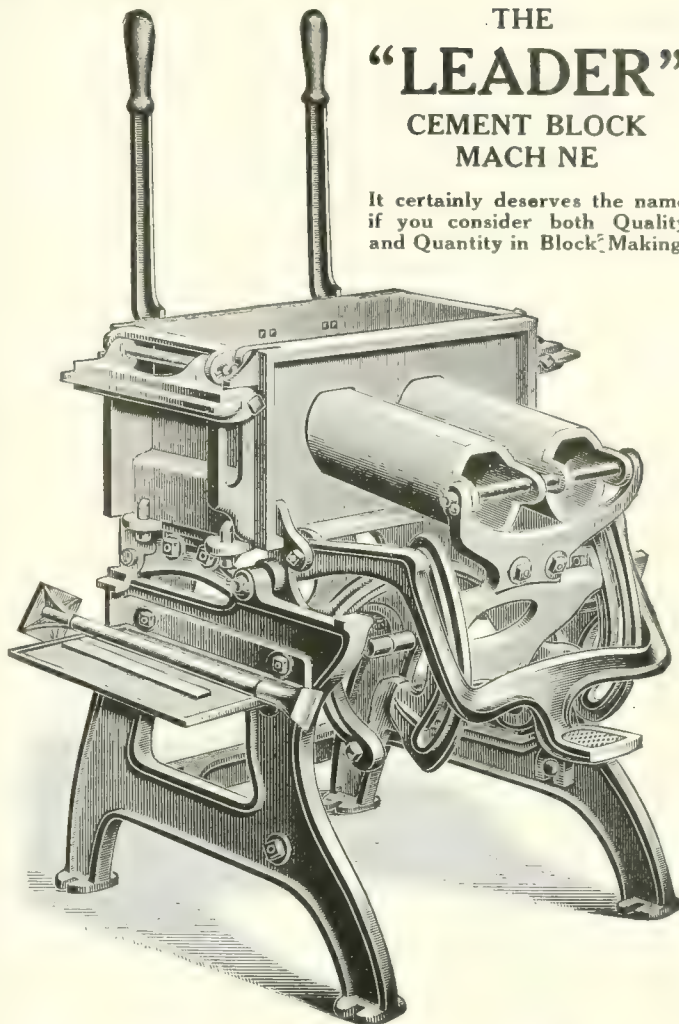
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It certainly deserves the name if you consider both Quality and Quantity in Block Making.

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This machine is the perfection of Cement Block Machinery, having all the valuable features known, as well as our exclusive **Automatic Action**.

It is this exclusive feature that has placed the "Leader" in the class the name signifies. For speed it has no equal, just consider this machine draws its own cores and that they are replaced by use of the small foot lever—it is not necessary to lay your tamper down—it is not necessary to draw or replace the core by hand.

### Construction

The "Leader" is set up complete and tested before leaving our factory. It is made of the best grade of grey iron and well braced in all working parts.

We use cast iron pallets with handles on each end of every pallet, no carrier is needed.

Our line of face plates is unequalled—all taken from the natural cut stone.

### Cores

The elliptical shaped core makes the strongest block, although we have the standard (one-third of block volume for cores)—this shape braces the block on the core corners.

ASK FOR PRICES

## THE EXETER MFG. CO., LIMITED EXETER, ONTARIO

Manufacturers of:—Road Graders, Road Drags, Cast Iron and corrugated Culverts, Cement Block, Brick and Tile Machines, School Church and Farm Bells, Hardware Specialties.



# Price List of Building Materials—Revised to Date

EDITOR'S NOTE—Great care is exercised in obtaining prices for this department. They are as accurate as it is possible for us to make them. We know, however, that because of varying conditions, different dealers' prices are bound to vary somewhat; and our purpose in publishing this department is to give readers an idea of prices, rather than absolutely definite information.

In some cases a range of prices appears. This is given to cover the variation in quotations given by different dealers, and also to cover slight variations in conditions of measurement or purchases, which space will not permit us to specify in detail.

We will be glad to give readers prices on materials not appearing here (hardwood flooring and hardware trim for instance), and also the names of dealers from whom such materials can be obtained. Such information will be supplied promptly if you write us specifying in detail what is desired.

## PRICE AT MONTREAL

### Hemlock Lumber

2 x 4 in. to 2 x 12 in., 8 to 14 ft.....	\$24.00
2 x 4 in. to 2 x 12 in., 16 ft.....	26.00
2 x 4 in. to 2 x 12 in., 18 ft.....	28.00 to 30.00
1 in. hemlock No. 1.....	22.00
No. 1 hemlock decking.....	23.00 to 25.00
No. 2 hemlock dimensions and 1 in....	28.00 to 30.00

### Pine

1 in. common and better pine 8 to 12 in. wide, rough.....	\$32.00 to 40.00
2 in. white pine, mill stock.....	29.00 to 33.00
3/4 x 8 and 10 in. pine shelving.....	36.00 to 45.00
3/4 x 12 pine shelving.....	42.00 to 50.00
No. 1 white pine flooring.....	40.00
No. 1 spruce flooring.....	30.00
No. 1 pine decking, D2S.....	40.00
No. 1 pine V. or beaded sheeting.....	40.00
No. 2 pine V. or beaded sheeting.....	30.00

### Pine Trim for Paint Finish

4 in. casing, per 100 ft.....	\$1.75
5 in. casing, per 100 ft.....	2.10
8 in. pine base, per 100 ft.....	3.25
10 in. pine base, per 100 ft.....	4.20
4 in. pine window stool, per 100 ft. ....	2.75

### Shingles, Lath Roofing, Etc.

No. 1 pine lath.....	5.00
No. 2 pine lath.....	4.50
No. 1 spruce lath.....	4.00

### Cedar Posts—Fence

5 in. at small end.....	5c. foot
7 in. at small end.....	7c. foot

### Hardware

Nails, wire, common.....	\$2.30 base keg
Nails, cut, common.....	2.50 " "
Sash weights, cast iron.....	1.50 per 100 lbs.
Tarred felt paper.....	.43 roll
Building paper.....	.35 roll

### Brick, Tile, Terra Cotta, Sewer Pipe

No. 1 dry pressed red bricks.....	18.00
No. 1 dry pressed buff bricks.....	20.50
Red stock bricks.....	11.50
Grey stock bricks.....	12.00
Wire cut brick for foundation work ..	10.00
Fire brick.....	25.00
Sewer pipe, 4-inch.....	10c. foot
Sewer pipe, 6-inch.....	15c. foot

## Price at Montreal—Continued

### Cement, Plaster, Stone, Etc.

Cement (bags extra).....	1.85 bbl.
Sand, for cement or brick work.....	1.15 ton
Lime.....	.30 per 100 lbs
Hydrated lime.....	10.00
Mortar color.....	5.00 bbl.
Plaster of paris.....	3.00
Crushed stone, 2 in.....	1.50
Crushed stone, 1 in.....	1.60
Crushed stone, 3/4 in.....	1.75
Hardwall plaster.....	\$9.50 to 12.00 neat
Gravel.....	6.50 sanded ton
Hair (plaster).....	1.85 yard
	.03 per lb.

## PRICE AT TORONTO

### Hemlock Lumber

2 x 4 in. to 2 x 12 in., 8 to 14 ft.....	\$24.00 to 29.00
2 x 4 in. to 2 x 12 in., 16 ft.....	24.00 to 29.00
2 x 4 in. to 2 x 12 in., 18 ft.....	26.00 to 30.00
1 in. hemlock No. 1.....	24.00 to 28.00
No. 1 hemlock decking.....	26.00 to 29.00
No. 2 hemlock dimensions and 1 in....	20.00 to 24.00

### Pine

1 in. common and better pine 8 to 12 in. wide, rough.....	\$28.00 to 35.00
2 in. white pine, mill stock.....	29.00 to 34.00
3/4 x 8 and 10 in. pine shelving.....	33.00 to 40.00
3/4 x 12 pine shelving.....	45.00 to 48.00
No. 1 white pine flooring.....	34.00 to 37.00
No. 1 spruce flooring.....	27.00 to 32.00
No. 1 pine decking, D2S.....	28.00 to 33.00
Spruce decking.....	27.00 to 32.00
No. 1 pine V. or beaded sheeting.....	35.00 to 39.00
No. 2 pine V. or beaded sheeting.....	30.00 to 33.00

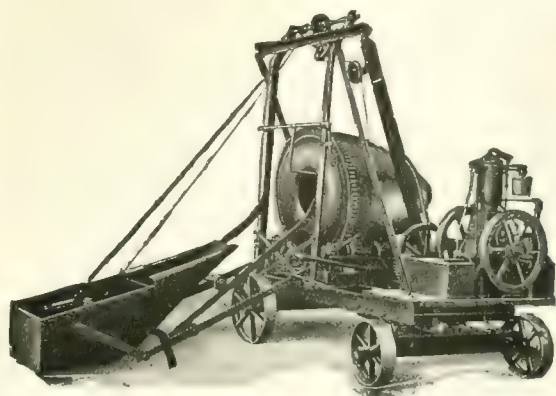
### No. 1 Common Yellow Pine

2 x 4 in. to 2 x 14 in., 10 to 16 ft.....	\$25.00 to 36.00
2 x 4 in. to 2 x 14 in., 18 to 20 ft.....	29.00 to 38.00
2 x 4 in. to 2 x 14 in., 22 to 24 ft.....	31.00 to 40.00

### Yellow Pine Finish

4/4 x 6, 8, 10 and 12 B. & B. smoke finish.....	\$41.00
5/4 x " " " " " ".....	45.00
6/4 x " " " " " ".....	45.00
8/4 x " " " " " ".....	45.00
4/4 x " " " " " " steam finish.....	45.00 to 50.00
5/4 x " " " " " ".....	48.00 to 50.00
6/4 x " " " " " ".....	48.00 to 50.00
8/4 x " " " " " ".....	50.00 to 55.00

**NOTE TO READERS.** We would be glad to have suggestions from readers as to the extension or modification of this list.



No. 3 Heart-Shaped Mixer

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When you buy a Wettlaufer Machine you buy a guarantee of efficiency and economy.

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All bearings have our *Improved Centre Oiling System* which carries out all grit and allows nothing to work in. This system increases the life of the bearings 100 per cent.

The No. 1 *Heart-Shaped Mixer* will save you many dollars on any kind of concrete, brick or block work or fine mortar.

**O**UR *Famous Little No. 0 Power Mixer* is built by first-class mechanics of first-grade materials only. *Channel Steel Frames* and our *Special Process Semi-steel Castings* used throughout.

With this machine five men can mix from 25 to 30 yards per day. No soft scaly spots in concrete mixed with a Famous Little No. 0—it is all uniform.

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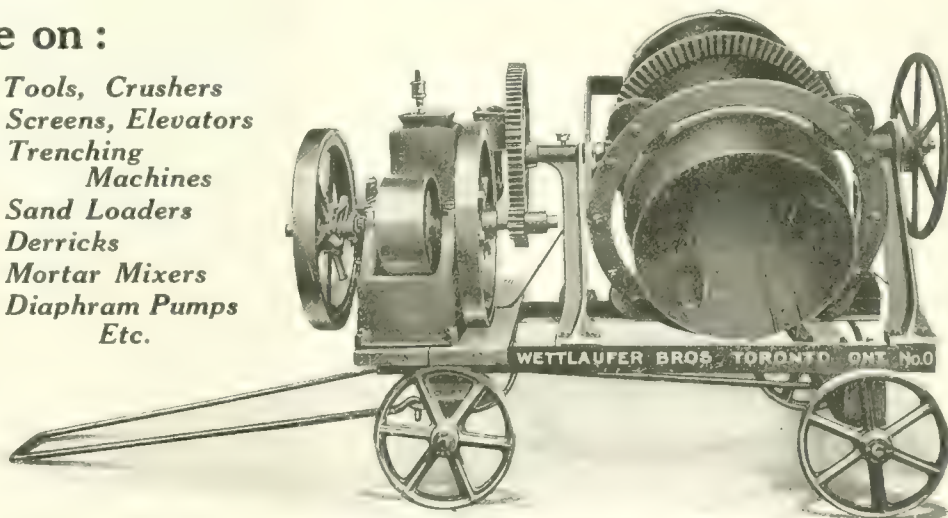
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Calgary



## Price List of Building Materials—Continued.

## Price at Toronto—Continued

## Pine Trim for Paint Finish

4 in. casing, per 100 ft. ....	\$1.80 to 2.00
5 in. casing, per 100 ft. ....	2.00 to 2.50
8 in. pine base, per 100 ft. ....	2.75 to 3.25
10 in. pine base, per 100 ft. ....	4.00 to 4.50
4 in. pine window stool, per 100 ft. ....	3.00

## Hardwood Trim, Flooring, Etc.

Quotations will be given on request.  
See editor's note above.

## Shingles, Lath Roofing Etc.

XXX B. C. cedar shingles .....	\$3.60 per M
N. B. extras .....	4.00
No. 1 pine lath .....	5.00 to 5.50 per M
No. 2 pine lath .....	4.75 to 5.00
No. 1 spruce lath .....	4.75
Roofing .....	1 ply—\$1.60 per sq.
	2 ply— 2.00 "
	3 ply— 2.40 "

## Cedar Posts—Fence

5 in. at small end .....	.25 each
7 in. at small end .....	.50 each

## Hardware

Nails, wire, common .....	\$2.35 cwt.
Nails, cut, common .....	2.95
Sash weights, cast iron .....	1.75
Tarred felt paper .....	.65 roll
Building paper .....	.45

## Glass

United inches	Star	D.D.
Up 25 .....	\$4.25	6.25
26-40 .....	4.65	6.75
41-50 .....	5.10	7.50
51-60 .....	5.35	8.50
61-70 .....	5.75	9.75
71-80 .....	\$6.25	\$11.00
81-85 .....	7.00	12.50
86-90 .....	7.75	15.00
91-95 .....		17.50
96-100 .....		20.50
101-105 .....		24.00
106-110 .....		27.50

Less 20 per cent. on Star and 25 per cent.  
on D. D. f.o.b. Toronto.

Wired glass .....	18c. to 20c. per sq. ft.
-------------------	--------------------------

## Brick, Tile, Terra Cotta, Sewer Pipe

No. 1 dry pressed red bricks .....	\$15.00 to 18.00 pr M
No. 1 dry pressed buff bricks .....	14.50 to 18.00
Red stock bricks .....	10.00 to 12.50
Sand Lime Brick .....	9.25 to 9.75
Grey stock bricks .....	10.50 to 12.50
Sewer Brick .....	11.00
Wire cut brick for foundation work ..	9.25 to 10.50
Porous terra cotta bricks .....	12.00 to 15.00
No. 1 enamelled bricks, all colors, from	80.00 to 150.00
Fire brick .....	26.00 to 30.00
Tapestry brick .....	20.00 to 34.00
Sewer pipe, 4-inch .....	10c. foot
Sewer pipe, 6-inch .....	16c. foot
Verandah post caps, 16 in. ....	1.45 each
20 in. ....	1.75 "
Chimney Caps, 1 flue in 1 piece .....	2.00 "
2 flues in 2 pieces .....	3.50 "
3 flues in 3 pieces .....	5.00 "

## Cement, Plaster, Stone, Etc.

Cement (bags extra) .....	\$1.85 bbl.
	(1.55 in car lots)
Sand, for cement or brick work .....	1.75 a yard

## Price at Toronto—Continued

Lime .....	.38 cwt.
Hydrated Lime (Canadian) .....	10.00 ton
Hydrated Lime (American) .....	11.00 "
Mortar color .....	black, 3; red, 1½
Plaster of paris .....	\$1.50 to 2.50
Crushed stone, 2 in. ....	1.30 to 1.40
Crushed stone, 1 in. ....	1.45
Crushed stone, ¾ in. ....	1.50
Hardwall plaster .....	8.60
	4.60 sanded
Gravel .....	1.80
Hair (plaster) .....	.07 lb.

## PRICE AT WINNIPEG

## Hemlock Lumber

2 x 4 in. to 2 x 12 in., 8 to 14 ft. ....	\$29.00
2 x 4 in. to 2 x 12 in., 16 ft. ....	29.00
2 x 4 in. to 2 x 12 in., 18 ft. ....	29.00

## Shingles, Lath Roofing, Etc.

XXX B. C. cedar shingles .....	\$4.00 & 3.50 per M
No. 1 pine lath .....	5.75 per M
Metal lath .....	.16 to .20
Roofing felt (2 ply) .....	2.50 per roll

## Hardware

Nails, wire, common .....	\$3.00 per keg
Nails, cut, common .....	3.35
Sash weights, cast iron .....	2.75 cwt.
Tarred felt paper .....	1.00 per roll
Building paper .....	.90
Insulating paper .....	1.25

## Glass

United inches	Single	Double
Up 25 .....	\$4.75	6.50
26-40 .....	\$5.10	\$7.00
41-50 .....	5.65	8.00
51-60 .....	6.15	8.75
61-70 .....	6.65	9.50
71-80 .....	7.25	10.50
81-85 .....		11.50
86-90 .....		12.50
91-95 .....		14.50
96-100 .....		17.00
101-105 .....		19.50
106-110 .....		22.50

## Brick, Tile, Terra Cotta, Sewer Pipe

No. 1 dry pressed red bricks .....	\$25.00 to 50.00
No. 1 dry pressed buff bricks .....	25.00 to 50.00
Red stock bricks .....	13.00
Sand Lime Brick .....	12.00
Porous terra cotta bricks .....	18.00 per M
No. 1 enamelled bricks, all colors, from	100.00
Fire brick .....	45.00
Oriental brick .....	35.00
Sewer pipe, 4-inch .....	.10½ per ft.
Sewer pipe, 6-inch .....	.16½ per ft.

## Cement, Plaster, Stone, Etc.

Cement (bags extra) .....	\$2.50 per bbl.
Sand, for cement or brick work .....	1.75 a yard
Lime .....	.32 per bu.
Hydrated Lime .....	12.00 per ton
Mortar color .....	.05 per lb.
Plaster of paris .....	0.75 per bag
Crushed stone, 2 in. ....	2.50 per yard
Crushed stone, 1 in. ....	2.75

NOTE TO READERS. We would be glad to have suggestions from readers as to the extension or modification of this list.

## Price List of Building Materials—Continued.

## Price at Winnipeg—Continued

Crushed stone, ¾ in. ....	2.75
Hardwall plaster .....	12.00 per ton
Gravel .....	1.85 per yard
Hair (plaster) .....	1.25 per bale

## PRICE AT VANCOUVER

## Shingles, Lath Roofing, Etc.

XXX B. C. cedar shingles .....	\$2.20 & 2.10 per M
No. 1 pine lath .....	2.25 per M

## Hardware

Nails, wire, common .....	\$3.25 per keg
Nails, cut, common .....	4.25
Tarred felt paper .....	.90 per roll
Building paper .....	.70

## Price at Vancouver—Continued

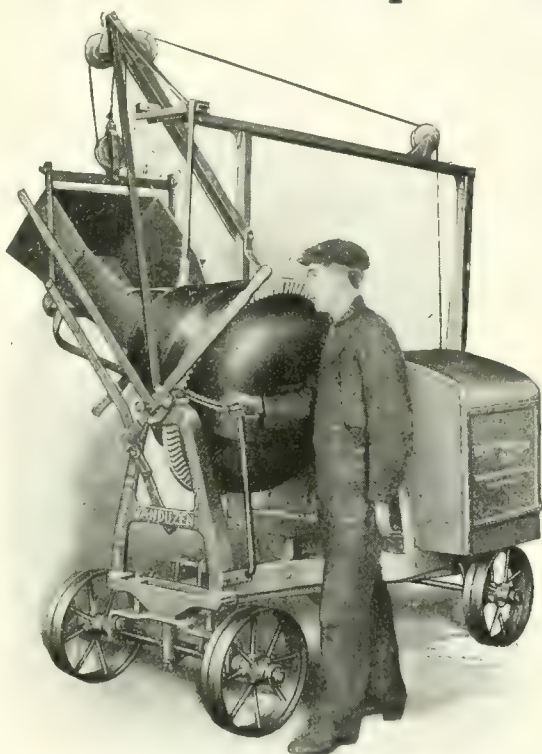
## Brick, Tile, Terra Cotta, Sewer Pipe

No. 1 dry pressed red bricks .....	\$45.00 per M
No. 1 dry pressed buff bricks .....	45.00
Red stock bricks .....	13.00
Fire Brick .....	45.00
Sewer pipe, 4-inch .....	.14 per ft.

## Cement, Plaster, Stone, Etc.

Cement (bags extra) .....	\$3.00 per bbl.
Lime .....	1.25 per bbl.
Hydrated Lime .....	4.25 per bbl.
Plaster of paris .....	4.50 per bbl.
Hardwall plaster .....	14.50 per ton
Hair (plaster) .....	14.50 per ton

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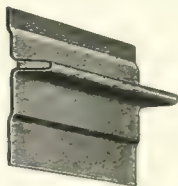
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**Asbestos**  
Asbestos Mfg. Co., Montreal.

**Asbestos Goods**  
Asbestos Mfg. Co., Montreal.

**Asphalt**  
Walkerville Roofing Mfg. Co., Walkerville, Ont.

**Asphalt, Felt**  
Walkerville Roofing Mfg. Co., Walkerville, Ont.

**Asphalt Paints**  
Walkerville Roofing Mfg. Co., Walkerville, Ont.

**Asphalt Slate Shingles**  
Walkerville Roofing Mfg. Co., Walkerville, Ont.

**Automatic Gas-Steam Boilers**  
Consumers' Gas Co., Toronto.

**Barrows and Concrete Carts**  
London Concrete Machinery Co., London, Ont.

**Baled Shavings**  
The R. Laidlaw Co., Limited, Toronto.

**Band Saws**  
Henry Disston & Sons, Philadelphia.

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Metal Shingle & Siding Co., Preston.

**Belting**  
Stuart Machinery Co., Ltd., Winnipeg.

**Bevels**  
Henry Disston & Sons, Philadelphia.

**Blinds, outside shutters**  
Georgian Bay Shook Mills, Midland.  
The R. Laidlaw Co., Limited, Toronto.

**Blinds, Venetian**  
Georgian Bay Shook Mills, Midland.  
The R. Laidlaw Co., Limited, Toronto.

**Blue Printing**  
Eugene Dietzgen Co., Ltd., Toronto.

**Blue Print Papers**  
Eugene Dietzgen Co., Ltd., Toronto.

**Boiler Feed Pumps**  
Stuart Machinery Co., Ltd., Winnipeg.

**Boilers and Engines**  
Stuart Machinery Co., Ltd., Winnipeg.

**Bricks (Common face and special face)**  
Sun Brick Co., Ltd., Toronto.  
Milton Pressed Brick Co., Toronto.

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Dennis Wire & Iron Work Co., London.

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Russill Hardware Co., Toronto.

**Builders' Supplies**  
Bournival & Co., Montreal.  
Georgian Bay Shook Mills, Midland.

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The R. Laidlaw Co., Limited, Toronto.  
Walkerville Roofing Mfg. Co., Walkerville, Ont.

**Burial Vault Molds**  
Ideal Concrete Machinery Co., London.

**Cars—Contractors**  
Stuart Machinery Co., Ltd., Winnipeg.  
**Casement and Sash (Steel and Bronze)**  
W. H. Thornhill Co., Winnipeg.

**Carts, Concrete**  
London Concrete Machinery Co., London, Ont.

**Ceilings, Metal**  
Metal Shingle & Siding Co., Preston.

**Cement (Portland)**  
Braid & McCurdy, Winnipeg, Man.  
Ontario Lime Association, Toronto.

**Cement Tools**  
Wettlaufer Bros., Toronto, Ont.

**Cement Stains**  
Russill Hardware Co., Toronto.  
London Concrete Machinery Co., London, Ont.

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Stuart Machinery Co., Ltd., Winnipeg.

**Chain Sprockets**  
Stuart Machinery Co., Ltd., Winnipeg.

**Circular Saws**  
Henry Disston & Sons, Philadelphia.

**Colors for Concrete**  
Ideal Concrete Machinery Co., London.

**Columns**  
Batts, Limited, Toronto.  
Georgian Bay Shook Mills, Midland.  
The R. Laidlaw Co., Limited, Toronto.

**Combination Woodworkers**  
W. A. Elliot, Toronto.  
Hutchinson Woodworker Co., Toronto.

**Concrete Block Machines**  
Exeter Mfg. Co., Limited, Exeter, Ont.  
Ideal Concrete Machinery Co., London.  
London Concrete Machinery Co., London, Ont.  
Wettlaufer Bros., Toronto, Ont.

**Concrete Brick Machine**  
Exeter Mfg. Co., Limited, Exeter, Ont.  
Ideal Concrete Machinery Co., London.  
London Concrete Machinery Co., London, Ont.  
Wettlaufer Bros., Toronto, Ont.

**Concrete Floor Scrapers**  
Exeter Mfg. Co., Limited, Exeter, Ont.

**Concrete Sill, Lintel and Dimension**  
Stone Machines

**Concrete Machinery**  
Ideal Concrete Machinery Co., London.

**Concrete Mixers**  
Bournival & Co., Montreal.

**Concrete Ornamental Forms**  
Exeter Mfg. Co., Limited, Exeter, Ont.  
**Concrete Sill, Lintel Machines**  
Exeter Mfg. Co., Limited, Exeter, Ont.  
**Concrete Tile Machines**  
Exeter Mfg. Co., Limited, Exeter, Ont.  
Ideal Concrete Machinery Co., London.  
Wettlaufer Bros., Toronto, Ont.

**Concrete Tile Machines**  
Exeter Mfg. Co., Limited, Exeter, Ont.

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Exeter Mfg. Co., Limited, Exeter, Ont.

**Concrete Tile Machines**  
Exeter Mfg. Co., Limited, Exeter, Ont.

**Concrete Reinforcements**  
Metal Shingle & Siding Co., Preston.

**Contractors' Machinery**  
The Stuart Machinery Co., Winnipeg.  
Wettlaufer Bros., Toronto, Ont.

**Contractors' Plants**  
Stuart Machinery Co., Ltd., Winnipeg.

**Conveying Machinery**  
Stuart Machinery Co., Ltd., Winnipeg.

**Corrugated Sheets (Asbestos)**  
Asbestos Mfg. Co., Montreal.

**Corrugated Sheets (Steel)**  
Metal Shingle & Siding Co., Preston.

**Cranes and Hoists**  
Stuart Machinery Co., Ltd., Winnipeg.

**Crestings**  
Metal Shingle & Siding Co., Preston.

**Cross-cut Saws**  
Henry Disston & Sons, Philadelphia.

**Crushers**  
Wettlaufer Bros., Toronto, Ont.

**Curb Stone Machines**  
Ideal Concrete Machinery Co., London.

**Cutouts**  
Duncan Electrical Co., Montreal.

**Daylight Rods**  
Consolidated Plate Glass Co., Toronto.

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London Concrete Machinery Co., London, Ont.

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Benson & Bray, Midland.  
Georgian Bay Shook Mills, Midland.

**Doors, Veneered**  
Batts, Limited, Toronto.

**Doors, Veneered**  
Georgian Bay Shook Mills, Midland.  
Benson & Bray, Midland.

**Door Trimmings**  
Metal Shingle & Siding Co., Preston.

**Doors (Sheet Steel and Bronze)**  
W. H. Thornhill Co., Winnipeg.

**Drag Scrapers**  
London Concrete Machinery Co., London, Ont.

**Drain Tile Machinery**  
C. S. Wert, Kendallville, Ind.

**Draughting**  
The Patent Selling & Mfg. Agency, Toronto.

**Drawing Materials**  
Eugene Dietzgen Co., Ltd., Toronto.

**Driers**  
London Concrete Machinery Co., London, Ont.

**Eavetroughs**  
Metal Shingle & Siding Co., Preston.

**Eavetrough and Conductor-Pipe**  
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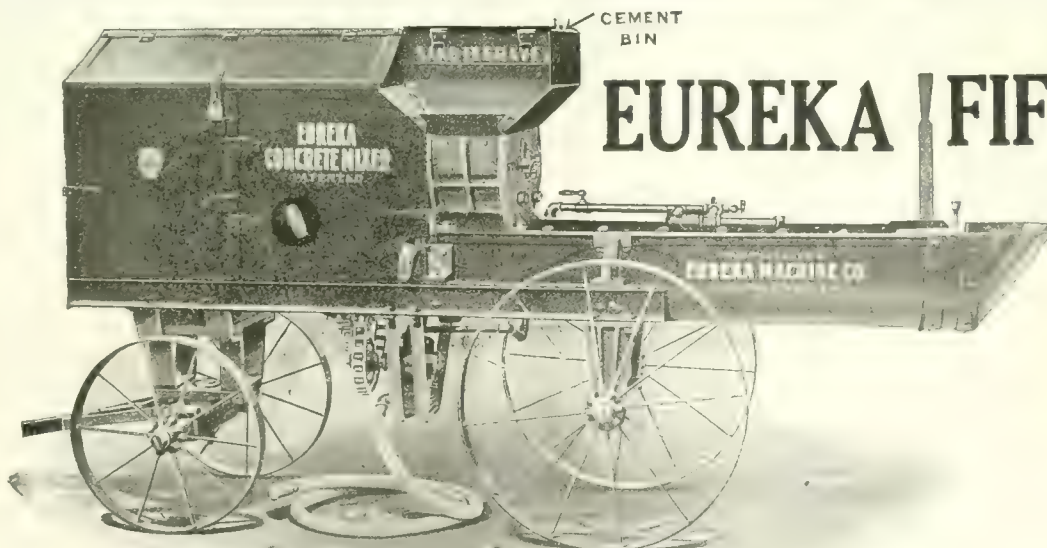
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Stuart Machinery Co., Ltd., Winnipeg.
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Dominion Ornamental Iron Co., Ltd., Toronto.  
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Dennis Wire & Iron Work Co., London.  
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Consumers' Gas Co., Toronto.
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The Toronto Plate Glass & Importing Co., Toronto.  
Queen City Glass Co., Toronto.  
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Consumers' Gas Co., Toronto.
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Walkerville Roofing Mfg. Co., Walkerville, Ont.
- Gravel Screens (Power)**  
Ideal Concrete Machinery Co., London.
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Walkerville Roofing Mfg. Co., Walkerville, Ont.
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Ontario Lime Association, Toronto.
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Double Claw Hammer Co., Brooklyn, N. Y.
- Hand Saws**  
Henry Disston & Sons, Philadelphia.
- Hand Scrapers**  
Fox Supply Co., Brooklyn, Wis.
- Hard Wall Plaster**  
Crown Gypsum Co., Lythmore, Ont.
- Hardwood Flooring**  
Batts, Limited, Toronto.  
Georgian Bay Shook Mills, Midland.  
The R. Laidlaw Co., Limited, Toronto.  
Siemen Bros., Ltd., Toronto.
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Stuart Machinery Co., Ltd., Winnipeg.
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Stuart Machinery Co., Ltd., Winnipeg.
- Herringbone Lath**  
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- Hoists**  
Hall-Holmes Mfg. Co., Jackson, Mich.  
Ideal Concrete Machinery Co., London.  
London Concrete Machinery Co., London, Ont.  
Wettlaufer Bros., Toronto, Ont.
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Stuart Machinery Co., Ltd., Winnipeg.
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Benson & Bray, Midland.  
Georgian Bay Shook Mills, Midland.  
The W. A. Moore Co., Ltd., Meaford.  
Wilson Bros., Ltd., Collingwood, Ont.
- Interlocking Hollow Building Tile**  
Sun Brick Co., Ltd., Toronto.
- Iron Fences**  
Dennis Wire & Iron Works Co., London.  
Eberhard-Wood Mfg. Co., Toronto.  
Geo. B. Meadows, Toronto.
- Joiners' Work**  
Georgian Bay Shook Mills, Midland.
- Keene's Cement**  
Braid & McCurdy, Winnipeg, Man.
- Lath**  
Batts Limited, Toronto.  
Galt Art Metal Co., Galt, Ont.  
Georgian Bay Shook Mills, Midland.
- The R. Laidlaw Co., Limited, Toronto.**  
Wilson Bros., Ltd., Collingwood, Ont.
- Lime**  
Ontario Lime Association, Toronto.
- Lockers, Steel**  
Dennis Wire & Iron Work Co., London.  
Geo. B. Meadows, Toronto.
- Lumber**  
Batts, Limited, Toronto.  
Georgian Bay Shook Mills, Midland.  
The R. Laidlaw Co., Limited, Toronto.  
Wilson Bros., Ltd., Collingwood, Ont.
- Machinery—Brick and Tile**  
Stuart Machinery Co., Ltd., Winnipeg.
- Machinery—Wood Working**  
Stuart Machinery Co., Ltd., Winnipeg.
- Mechanics' Tools**  
Russill Hardware Co., Toronto.
- Mill and Factory Supplies**  
Stuart Machinery Co., Ltd., Winnipeg.
- Model Makers**  
The Patent Selling & Mfg. Agency, Toronto.
- Mortar Colors**  
Ontario Lime Association, Toronto.
- Mitre Box**  
Goodell Mfg. Co., Greenfield, Mass.
- Mortar Gauges**  
Ideal Concrete Machinery Co., London.
- Mortar Mixers**  
London Concrete Machinery Co., London, Ont.
- Mouldings**  
Batts, Limited, Toronto.  
Georgian Bay Shook Mills, Limited, Midland, Ont.  
Wilson Bros., Collingwood.
- Ornamental Iron Work**  
Dennis Wire & Iron Works Co., London.  
Eberhard-Wood Mfg. Co., Toronto.  
George B. Meadows, Toronto.
- Nails**  
P. L. Robertson Mfg. Co., Milton.
- Ornamental Bronze Work**  
Dennis Wire & Iron Work Co., London.
- Ornamental Iron Work**  
Dennis Wire & Iron Work Co., London.
- Ornamental Moulds**  
London Concrete Machinery Co., London, Ont.
- Paints**  
Russill Hardware Co., Toronto.
- Patent Attorneys**  
The Patent Selling & Mfg. Agency, Toronto.  
J. A. MacMurty & Co., Toronto.  
Stanley Lightfoot, Toronto.
- Pile Driving Machinery**  
Stuart Machinery Co., Ltd., Winnipeg.
- Plaster**  
Crown Gypsum Co., Lythmore.  
Ontario Lime Association, Toronto.
- Plaster (Hardwall)**  
Crown Gypsum Co., Lythmore.  
Ontario Lime Association, Toronto.
- Plaster Corner Bead**  
Metal Shingle & Siding Co., Preston.
- Plaster Paris**  
Crown Gypsum Co., Lythmore.  
Ontario Lime Association, Toronto.
- Plumbs**  
Frank Sand Mfg. Co., Windsor, Ont.
- Plumbs and Levels**  
Henry Disston & Sons, Philadelphia.
- Plumbing Supplies**  
Russill Hardware Co., Toronto.
- Portable Saw Rigs**  
Oshkosh Mfg. Co., Oshkosh, Wis.
- Powder Paint**  
Russill Hardware Co., Toronto.

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## Build Your Factory With

# "Ideal" Hollow Concrete Blocks

Reinforced  
Pilaster  
Construction

### No Money Wasted for Wood Forms on This Factory



### Cost \$25,500

This shows the new desk plant of the Knechtel Furniture Co., Ltd., of Hanover, Ont., built by Henry Prast, contractor, of Hanover, Ont.

Dimensions: 181.5 feet x 80 x 46. The complete cost of the building was \$25,500. It would be impossible to duplicate this splendid factory, in concrete or brick, for the same money.

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HANOVER, ONT. \_\_\_\_\_ 191...

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Local Concrete Machinery Co.,  
London, Ont.

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Your favor of the 21st is received. We are delightedly pleased with the construction and consider a fortunate event that you happened along just when we were working on the plans. Our first intention was to have a concrete structure, but we have decided to believe that the "Ideal" is the best and most economical, especially in the case of large buildings where the building can be carried on.

The block machine used is "IDEAL". We feel a great obligation to the M. C. Co. for the assistance rendered us in planning the building. We sincerely trust that the machine, as shown, is durable and safe for construction. The Canadian Manufacturers Association has offered us a 25c rate on the building and contents.

The factory will be located in office space, Police Station, etc.

THE KNECHTEL FURNITURE CO.  
J. H. Knechtel

Further Details for the Asking  
**Ideal Concrete Machinery Company,**  
Limited  
211 King St., London, Ont.

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As Mr. Prast, the contractor, says, "The block used was the 8x8x16 in. Panel Face Design Ideal standard blocks for Main Building, and 8x10x16 in. for Dry Kilns, and Boiler and Engine House, all poured piers, also all Sills and Window and Door Heads were reinforced with 1-2 in. soft steel—and were handled much easier, cheaper and quicker than reinforced concrete or brick. This is without a doubt the best looking and most substantial factory building in town.

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**Pumps**  
 London Concrete Machinery Co., London, Ont.  
 Stuart Machinery Co., Ltd., Winnipeg.  
 Wettlaufer Bros., Toronto, Ont.

**Quarrying Machinery**  
 Stuart Machinery Co., Ltd., Winnipeg.

**Ready Roofing**  
 The R. Laidlaw Co., Limited, Toronto.  
 Walkerville Roofing Mfg. Co., Walkerville, Ont.

**Receptacles (Electrical)**  
 Duncan Electrical Co., Montreal.

**Red Slate Roofing**  
 Walkerville Roofing Mfg. Co., Walkerville, Ont.

**Ridge, Galvanized**  
 Metal Shingle & Siding Co., Preston.

**Ridgings**  
 Metal Shingle & Siding Co., Preston.

**Rivets**  
 P. L. Robertson Mfg. Co., Milton.

**Rock Crushers**  
 Wettlaufer Bros., Toronto, Ont.  
 Stuart Machinery Co., Ltd., Winnipeg.

**Roofing**  
 Asbestos Mfg. Co., Montreal.  
 Metal Shingle & Siding Co., Preston.  
 Walkerville Roofing Co., Walkerville.

**Roofing Tile Machines**  
 Ideal Concrete Machinery Co., London.

**Rubber Roofing**  
 Walkerville Roofing Mfg. Co., Walkerville, Ont.

**Sand Sifting Machines**  
 London Concrete Machinery Co., London, Ont.

**Sanded Roofing**  
 Walkerville Roofing Mfg. Co., Walkerville, Ont.

**Sash**  
 Batts, Limited, Toronto.  
 Benson & Bray, Midland.  
 Georgian Bay Shook Mills, Limited, Midland, Ont.  
 The R. Laidlaw Co., Limited, Toronto.  
 Wilson Bros., Collingwood.

**Saw Mill Machinery**  
 Stuart Machinery Co., Ltd., Winnipeg.

**Scraper Knives**  
 Fox Supply Co., Brooklyn, Wis.

**Scrapers**  
 Fox Supply Co., Brooklyn, Wis.

**Scrapers, Drag**  
 London Concrete Machinery Co., London, Ont.

**Scrapers, Wheel**  
 London Concrete Machinery Co., London, Ont.

**Scraper Sharpening Device**  
 Fox Supply Co., Brooklyn, Wis.

**Screens, Sand**  
 London Concrete Machinery Co., London, Ont.

**Screens, window and door**  
 Batts, Limited, Toronto.  
 Georgian Bay Shook Mills, Midland.  
 The R. Laidlaw Co., Limited, Toronto.

**Screws**  
 P. L. Robertson Mfg. Co., Milton.

**Sewer Pipe**  
 Ontario Lime Association, Toronto.

**Sewer Pipe Moulds**  
 London Concrete Machinery Co., London, Ont.

**Shingles**  
 Ideal Concrete Machinery Co., London.  
 Batts, Limited, Toronto.  
 Georgian Bay Shook Mills, Midland.

Wilson Bros., Ltd., Collingwood, Ont.

**Sheeting**  
 Batts Limited, Toronto.  
 Benson & Bray, Midland.  
 Georgian Bay Shook Mills, Midland.

**Sidewalk Dividing Plates**  
 London Concrete Machinery Co., London, Ont.

**Sidewalk Forms, Steel**  
 London Concrete Machinery Co., London, Ont.

**Sidewalk Prisms**  
 Consolidated Plate Glass Co., Toronto.

**Siding**  
 Batts Limited, Toronto.  
 Benson & Bray, Midland.  
 Georgian Bay Shook Mills, Midland.

**Sill and Cap Moulds**  
 London Concrete Machinery Co., London, Ont.

**Silo Block Machines**  
 London Concrete Machinery Co., London, Ont.

**Sockets, Brass and Porcelain**  
 Duncan Electrical Co., Montreal.

**Soldering Iron Heaters**  
 Consumers' Gas Co., Toronto.

**Shooks**  
 Georgian Bay Shook Mills, Limited, Midland, Ont.

**Skylights**  
 Metal Shingle & Siding Co., Preston.

**Stairs**  
 Batts, Limited, Toronto.  
 Georgian Bay Shook Mills, Midland.  
 The R. Laidlaw Co., Limited, Toronto.  
 Wilson Bros., Collingwood.

**Stairs, Iron**  
 Dennis Wire & Iron Work Co., London.  
 George B. Meadows, Toronto.

**Stanchions**  
 Metal Shingle & Siding Co., Preston.

**Steel Buildings and Garages**  
 Metal Shingle & Siding Co., Preston.

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 Stuart Machinery Co., Ltd., Winnipeg.

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**Stone Crushers**  
 Stuart Machinery Co., Ltd., Winnipeg.

**Store Front Bars**  
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 Detroit Show Case Co., Detroit.

**Storm Sash**  
 Batts, Limited, Toronto.  
 Georgian Bay Shook Mills, Midland.  
 The R. Laidlaw Co., Limited, Toronto.

**Store Fixtures**  
 Batts, Limited, Toronto.  
 Metal Shingle & Siding Co., Preston.  
 The R. Laidlaw Co., Limited, Toronto.

**Surveying Instruments**  
 Eugene Dietzgen Co., Ltd., Toronto.

**Tanks—Steel**  
 Stuart Machinery Co., Ltd., Winnipeg.

**Terra Cotta**  
 W. H. Thornhill Co., Winnipeg.  
 Toronto Plate Glass Importing Co., Toronto.

**Thimbles**  
 Metal Shingle & Siding Co., Preston.

**Tile, Block and Brick Cars**  
 London Concrete Machinery Co., London, Ont.

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 London Concrete Machinery Co., London, Ont.

**Tile Machine, Sidewalk**  
 London Concrete Machinery Co., London, Ont.

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 Georgian Bay Shook Mills, Midland.  
 The R. Laidlaw Co., Limited, Toronto.

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 London Concrete Machinery Co., London, Ont.

**Transmission Apparatus**  
 Stuart Machinery Co., Ltd., Winnipeg.

**Trowels (brick and plastering)**  
 Henry Disston & Sons, Philadelphia.

**Trucks**  
 Stuart Machinery Co., Ltd., Winnipeg.

**Turbine Pumps**  
 Stuart Machinery Co., Ltd., Winnipeg.

**Valley, Galvanized**  
 Metal Shingle & Siding Co., Preston.

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 Metal Shingle & Siding Co., Preston.

**Veneered Doors**  
 The W. A. Moore Co., Ltd., Meaford.  
 Batts Limited, Toronto.  
 Georgian Bay Shook Mills, Midland.  
 Benson & Bray, Midland.

**Ventilators**  
 Metal Shingle & Siding Co., Preston.

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 Batts, Limited, Toronto.  
 Benson & Bray, Midland.  
 Georgian Bay Shook Mills, Midland.  
 The R. Laidlaw Co., Limited, Toronto.

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 Georgian Bay Shook Mills, Midland.  
 The R. Laidlaw Co., Limited, Toronto.  
 Walkerville Roofing Mfg. Co., Walkerville, Ont.

**Wall Plugs**  
 Ideal Concrete Machinery Co., London.

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 P. L. Robertson Mfg. Co., Milton.

**Waterproof Paper**  
 Braid & McCurdy, Winnipeg, Man.

**Waterproofing**  
 Ideal Concrete Machinery Co., London.  
 W. H. Thornhill Co., Winnipeg.

**Watering Bowls for Stock**  
 Metal Shingle & Siding Co., Preston.

**Waterworks' Supplies**  
 Stuart Machinery Co., Ltd., Winnipeg.

**Weather Strips**  
 Eberhard-Wood Mfg. Co., Toronto.  
 William Pease Co., Hamilton.

**Window Frames—Complete**  
 Batts Limited, Toronto.  
 Benson & Bray, Midland.  
 Georgian Bay Shook Mills, Midland.

**Window Frames**  
 Batts, Limited, Toronto.  
 Georgian Bay Shook Mills, Midland.  
 Wilson Bros., Collingwood.

**Window Trimmings**  
 Metal Shingle & Siding Co., Preston.  
 W. H. Thornhill Co., Winnipeg.

**Window Screens**  
 Batts, Limited, Toronto.  
 Georgian Bay Shook Mills, Midland.  
 The R. Laidlaw Co., Limited, Toronto.

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 P. L. Robertson Mfg. Co., Milton.

**Wire Rope**  
 London Concrete Machinery Co., London, Ont.

**Wire Work (Special)**  
 The Stuart Machinery Co., Winnipeg.  
 George B. Meadows, Toronto.  
 Dennis Wire & Iron Works Co., London.

**Wood Mantels**  
 The W. A. Moore Co., Ltd., Meaford.

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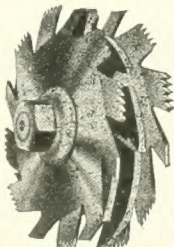
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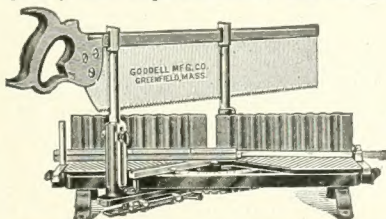
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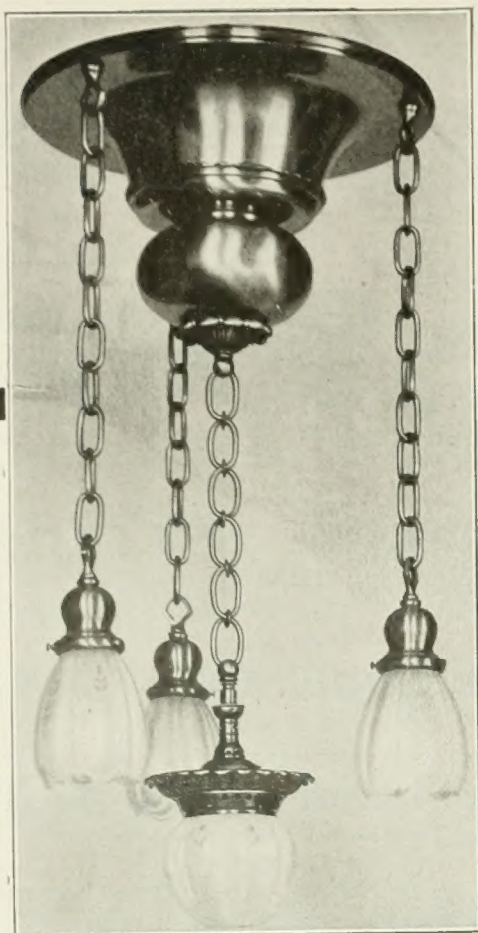


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